

**ASSESSMENT OF ADOPTABILITY TO SANITATION PRACTICES AMONG
COMMUNITIES IN NADUNGET SUB-COUNTY, MOROTO
DISTRICT-UGANDA**

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DECLARATION

I, Daniel Emadu, do hereby declare to the best of my knowledge that, this dissertation is my original work and has never been presented or submitted to any institution of learning for the award of Master’s degree of science in Public Health or any other award. Any material herein not of my original work, has the authors duly acknowledged.

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APPROVAL

This is to certify that this dissertation has been submitted for examination with my approval as the candidate's supervisor.

Signature:

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Date:

DEDICATION

I dedicate this dissertation to the Almighty God whose unlimited all-round provision has been undoubtedly evident. To my family without which this level of achievement would have not been possible; my wife Irene Emadu and children Esther and Jeremy who endured my absence and sacrificed their resources during moments of this study. To my larger family, Bishop Charles & Toto Margaret Obaikol and siblings Esther, Samuel, Nathanael, Ruth and Mark for your material and moral support. You all stood by me in prayer and gave material support. May the Almighty God richly bless you.

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OPERATIONAL DEFINITIONS

Sanitation mainly refers to access to and use of facilities and services for the safe disposal of human urine and faeces.

A safe sanitation system is that which is designed and used to separate human excreta from human contact at all steps of the sanitation service chain (from collection to final disposal).

Sanitation Practices refer to practices that separate human excreta from human contact

Good sanitation practices refer to sanitation practices that adequately separate human excreta from human contact

Poor sanitation practices refer to sanitation practices that do not adequately separate human excreta from human contact

Improved sanitation facilities include flush or pour-flush toilets, pit latrines, improved pit latrines and composting toilets where excreta are treated and disposed of in situ or transported and treated off-site.

Basic sanitation facilities are improved sanitation facilities not shared by households

Limited sanitation service results if the facility is shared by households

Adoptability implies acceptability and approval by communities of sanitation practices

Responsiveness implies awareness and receptiveness of community members in their sensitivity to sanitation practices

Undertakings are all endeavours, actions and or activities among community members to ensure implementation sanitation practices

Challenges refer to all sorts of resistance encountered by community members in trials and attempts to implement sanitation practices

Open defecation free: Where the entire unit of administration has abandoned defecating in the surrounding and are using toilet/latrine facilities

Cat method: Faecal matter disposal method where an individual makes an excavation on the ground, defecates and buries, mimicking a cat.

ABBREVIATIONS

AHSPR:	Annual Health Sector Performance Report
CI:	Confidence Interval
CVR:	Content Validity Ratio
DLG:	District Local Government
DSHCG:	District Sanitation and Hygiene Conditional Grant
GSF:	Global Sanitation Fund
KI:	Key Informant
NGO:	Non-Government Organisation
OD:	Open Defecation
ODF:	Open Defecation Free
UDHS:	Uganda Demographic Health Survey
UN:	United Nations
UNDP:	United Nations Development Program
UNICEF:	United Nations International Children's Emergency Fund
USF:	Uganda Sanitation Fund
SDG:	Sustainable Development Goal
SPR:	Sector Performance Report
WHO:	World Health Organization
WSSCC:	Water Supply and Sanitation Collaborative Council
WSP:	Water and Sanitation Program

ABSTRACT

Introduction: Good sanitation practices are vital for health as they contribute to infections prevention, as well as improve and maintain mental and social well-being (WHO, 2018). World over, 2.4 billion people still had no access to improved sanitation by 2015; majority of those living in rural communities (WHO, 2015). SDG 6 targets access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations by 2030. However, sanitation in Karamoja sub-region stands at 21.5%, Moroto 15.5% (SPR, 2017). Poor sanitation practices limit effective separation of human excreta from human contact, thereby increasing the risk to multiple diseases outbreaks.

Objective of the Study: To assess the adoptability to sanitation practices among communities in Nadunget sub-county, Moroto district – Uganda.

Methodology: A cross sectional study carried out in Nadunget sub-county involving 221 households selected using a mixture of purposive, proportionate and simple random sampling methods. Data was entered using Epi data version 3.1 and analysed using SPSS version 22.0. Analysis is presented in three phases; 1st, frequency distribution tables for all independent variables with their corresponding percentages, 2nd, a chi-square test using bivariate analysis at 95% confidence interval and then the multivariate analysis in which the results were then presented inform of Odds Ratio at 95% level of confidence.

Results: The proportion of households adopting to sanitation practices in Nadunget was 46.15%; which meant 53.85% still practiced poor sanitation practices. The study findings further established that, adoption to sanitation practices was observed in respondents who were business persons compared to those government employees (aOR=4.296;95%CI:1.779-10.377,p-0.001). The study finding also established that respondents whose monthly income was about 151,000 to 200,000 shillings were most likely to adopt sanitation practices compared those whose monthly income was less than 50,000 shillings (aOR=8.232;95%CI:1.848-36.673,p-0.006). There were higher chances of adopting to sanitation practices among respondents who agreed that they had a sanitation facility for disposal of human excreta unlike those who did not have (aOR=3.761; 95%CI: 2.152-6.571, p-0.000). Participants who were persuaded by NGOs were 2 times more likely to adopt sanitation practices compared to those who were persuaded by village chairpersons (aOR=2.945;95%CI:1.217-7.127,p-0.017). Respondents who indicated not having a sanitation facility 12 times most likely to use cat method to dispose their human excreta (aOR=12.897;95%CI:2.688-61.87,p-0.001). The study established that participants in villages where by-laws existed 5 times more likely to adopt sanitation practices over those in villages without by-laws (aOR=5.728;95%CI:2.53-12.967,p-0.000). Higher odds of adopting sanitation practices was seen among respondents who revealed that latrine facilities were shared (aOR=2.222; 95%CI: 1.274-3.876, p-0.005).

Conclusion: this study established that Only 102(46.15%) of the households accessed sanitation facilities; 119 (53.85%) still practiced poor sanitation indicating low adoptability to sanitation practices. Those that who had employment; those with a monthly income ranging from 151,000-200,000 Uganda shillings. Those who were persuade by NGOs, owning a sanitation facility, villages where by-laws, Households that shared sanitation were likely to adopt good sanitation practices. Further research should be carried out to address any gaps that the current study may not have addressed.

CHAPTER ONE: INTRODUCTION

1.0 Introduction

Good sanitation practices are vital for health as they contribute to infections prevention, as well as improve and maintain mental and social well-being. Unsafe sanitation systems lead to diarrhoea, neglected tropical diseases such as trachoma, vector-borne diseases as they facilitate proliferation of vectors such as *Culex* mosquitos. Unsafe sanitation has been linked to stunting that affects one quarter of under-five children globally (WHO, 2018).

This study aimed at assessing adoptability to sanitation practices among communities in Nadunget sub-county, Moroto district - Uganda. Presented in this chapter are the following sections; background to the study, statement of the problem, research objectives, research questions, significance of the study, and the conceptual framework.

1.1 Background to the Study

The Water Supply and Sanitation Collaborative Council (WSSCC) reported a population of about 1.5 billion people in 35 countries outside their intervention area still lacking sanitation and needing financial support from the Global Sanitation Fund (GSF, 2014). By the end of the Millennium Development Goal era in 2015, 2.4 billion people still had no access to improved sanitation. The shortfall in meeting the target of reducing by half the population not accessing improved sanitation being attributed to exclusion of the poor from water and sanitation services. 30% of people without access to an improved sanitation has the majority in rural communities (WHO, 2015). The UNDP Sustainable Development Goal 6 states “Availability and sustainable management of water and sanitation for all by 2030”. The target for sanitation therein states, “By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations.”

World over, 12% of the global population still practiced open defecation by the end of 2015; 90% of those lived in rural areas. Universal access to basic sanitation as well as ending open defecation by 2030 requires expedition of endeavours especially in Southern Asia and sub-Saharan Africa (UN, 2015).

The Swachh Bharat Mission in India contributed to an increase in sanitation coverage in rural India; moving from 38.7% in October 2014 to 78.98% in March 2018 and at the same time declaring 330 Districts, 9 states and 3 Urban Towns Open Defecation Free (ODF). The mission was guided by five principles of Political involvement, prioritization of behaviour change, being outcome (ODF) oriented as opposed to latrine coverage, emphasis on monitoring/verification for sustainability and an inclusive services delivery model (India, 2018). In Tanzania, despite increased funding into the sanitation sector, only 62% had access to improved sanitation; population growth and urbanization being the confounding factors. Open defecation was strongly associated with the poor and excluded (Thomas *et al*, 2013). One billion people on earth still have no sanitation facility whatsoever and continue to defecate in gutters, behind bushes or in open water bodies, with no dignity or privacy (WHO, 2015).

Uganda's National Development Plan II strives to achieve national latrine coverage of 79% by 2020. According to the Uganda Water and Sanitation Sector Performance Report 2017, the national sanitation coverage was 80% surpassing the national target for 2020. However, the average sanitation coverage for Karamoja sub-region stood at 21.5%, (Moroto 15.5%) many percentage points away from the national target.

With poor sanitation practices whereby, separation of human excreta from human contact is inadequately achieved, the spread of multiple diseases will continue to be a major challenge. Hence this research sought to assess adoptability to sanitation practices in Moroto district.

1.2 Statement of the Problem

From time immemorial, people in Karamoja have hardly dug pit latrines at their homesteads. This is also evidenced in the sector performance reports (SPR) from the Ministry of Water and Environment – Uganda (2016) that indicates that communities in Karamoja sub-region have limited access to safe sanitation. On average sanitation coverage for Karamoja sub-region stands at only 21.5%. Adopting a new practice is normally hard for a majority of people and breaking old habits difficult. If the sanitation situation is not addressed, infections and diseases from diarrhoea, trachoma, soil-transmitted helminths and stunting will remain a challenge (WHO, 2018).

The government allocates a District Hygiene and Sanitation Conditional Grant (DHSCG) of about 161 Million to the Karamoja sub-region each district receiving on average 23 Million annually to promote sanitation (AHSPR, 2016). The region also receives additional support from; Uganda Sanitation Fund (USF), UNICEF, Save the Children, World Vision, Goal International and other local organisations. Capacity building initiatives on sanitation from government and NGO partners have been carried out for respective staff (SPR, 2017).

However, despite the endeavours by government and partners above, good sanitation practices have remained low among communities in Moroto district (SPR, 2017). Already Uganda has been ranked 19th globally in the death of children under 5 years whereby diarrhoea was being stated among the top three most causes of 75% of the under-5 deaths (WHO, 2015).

This study therefore aimed at availing information necessary to shape policy and hence targeted approaches towards enhancing adoptability to sanitation practices among communities in Nadunget sub-County, Moroto district.

1.3 Research Objectives

1.3.1 General Objective

To assess the adoptability to sanitation practices among communities in Nadunget sub-county, Moroto district

1.3.2 Specific Objectives

- i. To establish if sanitation practices have been adopted among communities in Nadunget sub-county, Moroto district
- ii. To determine the responsiveness of communities towards adoptability of sanitation practices in Nadunget sub-county, Moroto district.
- iii. To establish undertakings being implemented to improve sanitation practices by communities in Nadunget sub-county, Moroto district.
- iv. To identify challenges met in promoting sanitation practices among communities in Nadunget sub-county, Moroto district.

1.4 Research Questions

- i. Are sanitation practices being adopted among communities in Nadunget sub-county, Moroto district?
- ii. Are communities responsive towards adaptability to sanitation practices in Nadunget sub-county, Moroto district?
- iii. What undertakings are implemented to improve sanitation practices by communities in Nadunget sub-county, Moroto district?
- iv. What are the challenges met in promoting sanitation practices among communities in Nadunget sub-county, Moroto district?

1.5 Significance of the Study

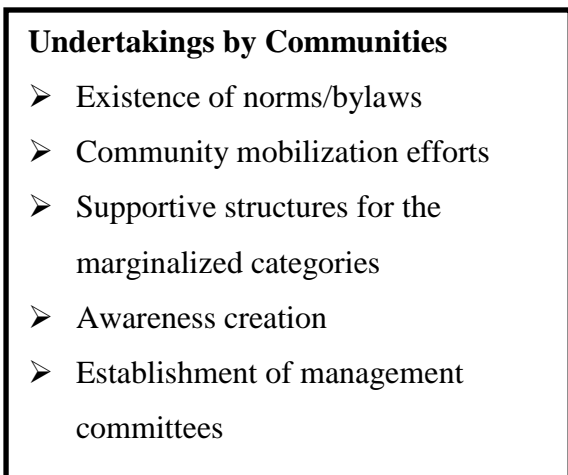
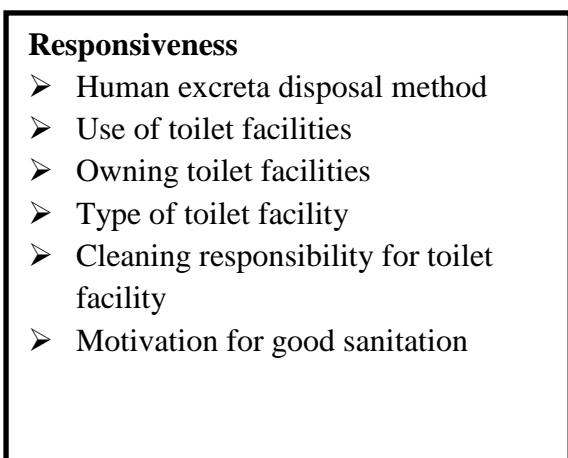
The National Development Plan II for Uganda sets the National sanitation target at 79% by end of financial year 2019/2020. The Sustainable Development Goal target for sanitation seeks to achieve adequate and equitable sanitation and hygiene for all and end open defecation by 2030.

The assessment of adoptability to sanitation practices among communities in the Nadunget sub-county provides information necessary to shape planning at local government and central government levels in terms of appropriate targeting for fast-tracking promotion of good sanitation practices among communities in the Moroto district, Karamojong sub-region.

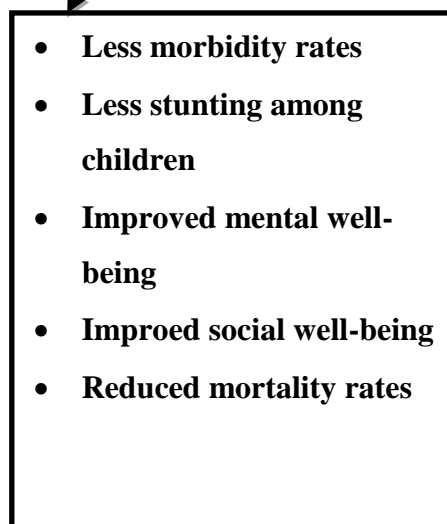
The study also avails information for more in-depth studies on sanitation in other regions by scholars in Uganda and globally.

1.6 Conceptual Framework

Independent Variables (Adoptability to)



Dependent Variable



1.6.2 Description of the Conceptual Framework

Given that this study aimed at assessing the adoptability to sanitation practices among communities in Nadunget sub-county, Moroto district-Uganda, the conceptual framework above expresses the independent variables as responsiveness, undertakings and challenges faced by the communities.

Responsiveness by the communities influences on sanitation practices may be measured through human excreta disposal methods, use of toilet facilities, ownership of toilet facilities, toilet facility type, who is responsible for cleaning of the toilet facilities and motivation factors for good sanitation.

Undertakings taken by the communities influences on sanitation practices may be measured through existence of norms/bylaws, community mobilisation efforts in place, supportive structures for marginalized categories, awareness creation and establishment of community management structures for sanitation promotion.

Challenges faced by communities influences on sanitation practices may be measured through prevailing soil structure constraints, availability of construction tools, availability of locally available construction materials, cultural practices, prevailing attitudes and availability of space for construction of sanitation facilities.

Adoption of sanitation practices which is the independent variable may be evident by presence of sanitation facilities in place, level of use of the sanitation facilities and the extent of open defecation free areas among the communities.

When the communities adopt to safe sanitation practices there will be less morbidity rates, less stunting among the children, improved mental and social well-being and reduced mortality rates that would have resulted from poor sanitation practices.

CHAPTER TWO: LITERATURE REVIEW

2.0 Introduction

This chapter reviewed literature related to assessments on adoptability to sanitation practices. The review was conceptualized under the objectives of the study and focuses primarily on: Responsiveness to sanitation practices among communities, community Undertakings in place for sanitation practices, Challenges being experienced in promoting sanitation practices among communities. This chapter started with a theory that underpinned adoptability to good sanitation practices.

2.1 Theoretical framework

The theoretical framework for this study was derived from Reasoned Action Theory developed by Martin Fishbein and Icek Ajzen (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975). The main tenet of this theory lies in its prediction that behavioural intent is created or caused by two factors: attitudes and subjective norms. The Reasoned Action Theory is based on four major assumptions summarized in attitude toward the behaviour, subjective norm, behavioural intentions and actual behaviour. The Theory of Reasoned Action is based on the assumption that people make rational decisions based on the information available to them and their behavioural intention to perform or not perform a particular behaviour is the immediate determinant of their actual behaviour. The theory suggests that behavioural intention leads to behaviour and also that it determines attitudes toward using a particular technology by influencing the normative value or subjective norm (Fishbein & Ajzen, 1975). In this theory, socially relevant human behaviours are under the control of the individual and the most direct powerful predictor of a behaviour is the intention to engage in that behaviour.

According to the Theory of Reasoned Action, people's beliefs about whether or not they are susceptible to disease and their perceptions of the benefits of trying to avoid it, influence their readiness to act (Janz & Becker, 1984). People have capacity to reason away from their attitudes and this guides their beliefs. Moreover, health behaviour is based on perceived threat of the disease. People are ready to act if they: believe they are susceptible to the condition (perceived susceptibility); believe the condition has serious consequences (perceived severity); believe taking action would reduce their susceptibility to the condition or its severity (perceived benefits); believe cost of taking action

(perceived barriers) is outweighed by the benefits; are exposed to factors that prompt action (cue to action) and are confident in the ability to successfully perform an action (self-efficacy).

According to Salazar (2010), the Theory of Reasoned Action is beneficial in assessing health protection or disease prevention behaviours. It is also useful in organizing information about clients' views on their state of health and what factors may influence them to change their behaviour. When used appropriately, the Theory of Reasoned Action provides organized assessment data about clients' abilities and motivation to change their health status. Health education programmes can be developed to better fit the needs of clients/patients. The Theory of Reasoned Action is divided into three major components, namely individual perceptions about health; modifying factors, which include demographic, socio- psychological and structural variables, and the likelihood of action (Dennill et al, 2007). The Theory of Reasoned Action can be used to acquire a better understanding of the knowledge, awareness, perception and practice among mothers bringing their children to treat diarrheal and other sanitation related diseases. This is the basis as to why this theory was chosen for this study to enable the researcher to assess whether the adoption of sanitation practices as a sanitation awareness approach can have an influence on sustainable sanitation behaviour change.

2.2 Adoption of sanitation practices

The continued neglect of the sanitation sector at all levels has been worrying (Water Aid, 2017). Overall, 80% of countries recognized right to water compared to just over 50% who recognized right to sanitation (WHO, 2012a). Until 2010, the United Nations (UN) had not recognized access to sanitation as a basic human right (WHO, 2012b) and therefore launched an advocacy initiative dubbed the "Sanitation Drive to 2015" in order to accelerate progress towards attainment of universal latrine coverage. Despite the intensive advocacy and lobby initiatives to raise the sanitation profile globally, the sanitation sector remains underfunded and a key challenge in most developing countries (WSP, 2012). The United Nations MDG target 7c aimed at halving the proportion of people without sustainable access to safe drinking water and basic sanitation by the year 2015. In this commitment, a target for sanitation of 79 percent was set to be reached by 2015. However, by end of 2015, the world had only attained 64% latrine coverage.

Globally, an estimated 2.5 billion people lack access to improved sanitation which is more than 35% of the world's population. Overall, (71%) of those who do not use improved latrines live in the rural areas where 90% of all open defecation takes place (WHO and UNICEF, 2015). Slight progress has been made especially in Sub Saharan Africa where improved latrine use level stands at 30%. Despite the regional progress made, expansion of latrine use is uneven and marked with disparities. In a study carried out in Ethiopia by Oljira D, Berkessa T S (2016), 88.2% were reported to have latrines, the majority (91%) being pit latrines. In Uganda, latrine coverage stood at 79% however, only 24% had access to an improved latrine facility with over 5 million Ugandan's practicing open defecation due to lack of latrines. Accelerating improved latrine use is both an economic and health gain (WHO, 2014). The biggest worry further is that even in the areas where there are latrines, their utilization is estimated below average (WHO, 2016b). Below are Responsiveness related factors, community undertaking factors and challenges determining adoption of sanitation practices.

2.3 Responsiveness to sanitation practices among communities

2.3.1 Disposal of human excreta

Okechukwu et al. (2012) in his study in Hultu Ejju Enessie, identified that non-functionality of latrine resulted into limited use of latrines. Supporting the quantitative finding, participants of the focus group discussion also mentioned long life habit and low awareness on use of latrine as major reasons for non-utilization of latrines. Okechukwu et al. (2012) added that the reasons given by respondents for not using latrines by ≤ 5 children were: large squatting hole (54.4%), being just a child (26.2%) and (19.4%) floor was not safe to stand. This shows that latrines constructed without considering child friendly features like small squatting hole, small foot rest and presence of the potty. The findings of this study were similar to the study done by Mengistie & Baraki (2010) in Hulet Ejju Enessie district. However, the use of latrines by children in the study area was not encouraging; a study in Tanzania showed that children's use of latrines was associated with a significant decrease in risk of Trachoma (Kamulu, 2015).

2.3.2 Hygiene conditions of the sanitation facility

Okechukwuet et al. (2012) observed that households that rarely cleaned their latrine were less likely to utilize their latrine as compared to households which cleaned their latrine daily. Latrines should be cleaned daily to prevent disease transmission by limiting contact

between faeces and flies. More crucially, unsanitary conditions and odour may deter people from using latrines. The study however, did not find any significant difference between those who cleaned their latrines daily and those who only cleaned when dirty. They found that households with hygienic latrines were 4.327 times more likely to utilize their latrines than those whose latrines were not hygienic. The strong association between hygienic condition of latrine and utilization could be attributed to fear of contamination, odour and flies that are major problems of unhygienic latrines. Strong association also seen between improved latrine use by all household members and conducive and hygienic latrine in Tanzania (Kamulu, 2015).

Ashebira, Sharmab & Alemuc (2013) ascertained that the issue of awareness is further measured in the hygiene practices envisaged in the community. Community members need to know that good hygiene starts with having and using a toilet or latrine. Ashebira et al. (2013) added that the major reasons for latrine use was the understanding about their minimization of danger of human excreta to health, to keep the environment clean, and provide privacy and convenience during defecation. This finding was also supported by the focus group discussion that revealed reasons for latrine use as to prevent diseases related with poor excreta disposal, to keep the environment clean and to provide for privacy. Ashebira et al., (2013) established that the most common reason for not utilizing of latrine by the households was a long-life habit (60.4%) and considering open defecation comfortable (18.9%).

2.3.3 Latrine cleaning responsibility

Cleaning responsibility has been highlighted as one of the primary determinants of adoption of sanitation practices (Mengistie & Baraki, 2010). Mengistie & Baraki (2010) indicated that in most households, the responsibility to clean toilets lies in the hands of females; awareness on the matter therefore needed to be created. Education and creating awareness are one among the 16 packages included in the health extension packages health extension workers employed to implement these packages provide a routine health education to improve the community awareness to increase latrine utilizations (Sara (2014). This implies that as the educational level of individual increased latrine utilization will increase. Mengistie & Baraki, (2010) further added that level of awareness determines very much on the extent of toilet utilization in rural communities. They argued that educating women particularly is a key ingredient in the fight against child malnutrition and

infant mortality. It is glaring that education of women results in sustainable fertility rates, increased birth spacing and lower maternal death. For every year of a girl's education, there is a 10% reduction in the likelihood of her prospective child dying before the age of five. Besides reduction in open defecation and improvement of sanitary facilities, education of women and their health appear to have a high correlation with growth of children. 1% improvement in female literacy can reduce child stunting by 0.5% and also; improving female literacy by 1% will reduce OD incidence by 1.4%.

Mengistie & Baraki (2010) while basing on the result of multivariate analysis from socio-demographic factors as similar to the study in Hulet Ejju Enessie households with secondary school children were 3.739 times more likely to utilize latrine compared to households without secondary school children. This might be due to the fact that secondary school students were more exposed to hygiene information in the school environment. The extents of latrine utilization were 2.437 times more likely for mothers who can read and write than those unable to read and write. The presence secondary school student and educational status of mother positively favoured the improvement of latrine utilization in the home environment. They also found out that farmer mothers were 67.9% less likely to utilize latrine as compared to housewives. This might be due to the fact that housewife's have a higher chance of staying in and around their home for a long time, which have great contribution for use of household latrine. The extents of latrine utilization were 62.1% less likely for households having ≤ 5 years children than those without ≤ 5 children. This might be due to open defecation practice of children and improper disposal of child faeces by parents.

2.3.4 Perceived diarrheal diseases cause

Tadessie and Alemu (2014) undertook a study in Northern Ethiopia and established that one major factor behind less utilization of latrines among communities is lack of required knowledge on what causes and prevents diarrheal diseases. They indicated that the factors that help the utilization of latrines were mainly community attitude and lack of understanding of the benefits of the latrine use and nature of the work the community engaged in.

On the other hand, Spears, Ghosh & Cumming (2013) in their study in East Gojam Zone, found that presence of a school going child in a household, duration of owning a latrine, peer pressure, and self-initiation to own latrine due to the promotional activity of health

extension workers were the major factors affecting utilization of latrines. This was inconsistent with the study conducted in similar district in the south Ethiopia (Anteneh and Kumie, 2017).

Similar finding was reported from the two studies (Godana, 2013 and Heijnen & Peletz, 2014). This explained that the barrier for the effective utilizations of latrines also extended to re-enforcing factors. There was a relationship between the attitude and practice of latrine utilization and improved water supply in places with high risk to water contaminations because faeces were easily washed in to water sources. General diarrheal disease prevention is comprehensive and not believable to those living in poor setting. Changing the cultures and beliefs of the society in using toilets and avoiding open filed defecation may take longer time because of nature of the occupation. Heijnen & Peletz, (2014) further add that many communities who resort to bushes have no idea of how these increases diarrheal diseases in their communities. They added that they have no idea on disposing-off faecal waste of children that they can lead to breeding of mosquitoes and other germs that can later cause diseases to them and cost a lot of money and time to treat them.

2.4 Community Undertakings to enforce sanitation practices in communities

2.4.1 Existence of norms/bylaws

Harpe (2009) observed that an enabling environment provided for by existent by-laws ensure effective delivery of water, sanitation and hygiene programs. Although lack of finance and poor quality of government's subsidized latrines are constraints for not adopting latrines, our results show that primarily old habits and strongly ingrained beliefs around impurity and pollution and the required rituals for purification and cleansing post-defecation in societies may play a big part in the choice to continue defecating in the open in the study area. Faeces have always been considered ritually impure as well as physically filthy and water as the necessary medium of purification and ritual cleansing in society (Bonu & Kim, 2009). Bathing and clothes changing rituals are deeply ingrained practices post-defecation and after many other kinds of ritual defilement in Indian society (O'Reilly & Louis, 2014). Cairncross et al. (2010) acknowledges bylaws to be able to play an immense role in sanitation promotions as they ensure sanitation facilities are constructed where new houses are to be constructed and thereby increase access to latrine facilities. Together these cultural beliefs and practices explain the strong importance households

have placed on the need for water provisioning inside the latrine to accomplish required cleansing acts following defecation (Jenkins, 1999). In Aburi community in Ghana, Owusu and Adjibolosoo (2016) noted in disagreement that even with enforcement of sanitation by-laws by the district assembly, it was not deterrent enough to positively change behaviour of the community members because of their attitudes. Ritual pollution may extend to simply touching or entering the latrine for some higher castes (Banda, Sarkar, Gopal, Govindarajan, Harijan & Jeyakumar, 2017), as was described by Brahmin participants in the SF latrine group. This clearly poses a considerable barrier to safe child faeces disposal in the latrine as well as latrine cleaning if elaborate water purification rituals are perceived to be too time-consuming or difficult to perform, added to arguments for providing water availability in the latrine. This possibility is supported by findings from a survey of child faeces disposal practices in rural Indian households with a functioning latrine, that water availability on the premise for using the latrine was associated with safe child faeces disposal (Bhattacharya, Joon & Jaiswal, 2011).

Beliefs that faeces are impure also caused a few participants to consider the practice of containing faeces in the latrine pit in the house as a ‘sin’, because idols and pictures of gods that are revered are kept and worshipped in every house; having toilets within or next to the house makes the entire house impure. These kinds of strong traditional beliefs can hold back people from adopting the new practice of defecating safely inside latrines (O’Connell, 2014). The importance of considering cultural beliefs, however, has long held true for changing sanitation around the globe (Hammer et al., 2013).

2.4.2 Community mobilization efforts

The reports from the health offices said that the majority of the households in the community had latrine utilized by the respective age groups; however, the reality in the ground was totally different. The other factor that acted as barrier for the utilization of latrine was attitudes of the community and the utilization was restricted to the times of health professionals’ visits. This finding is consistent with the study conducted in Melekoza Woreda, South Ethiopia (Mengistie & Baraki, 2010).

Campbell, Elia, and Lunn (2000) ascertained that mobilizing communities to use pit-latrines is very much fundamental to increased utilization. This involves mobilizing communities to completely eliminate open defecation. It focuses on sanitation and hygiene behaviour change, in contrast with conventional approaches to improve sanitation-

typically involves household subsidies for infrastructure-which have proven neither scalable nor sustainable. Mobilization empowers communities to take collective action to analyse their sanitation and waste situation, and to bring about collective decision-making to stop open defecation, using locally available resources, rather than focus on outside interventions such as hardware subsidies.

Hammer, Jeffrey, and Spears (2013) further argue that mobilizing communities to use pit-latrines call for sanitation interventions to typically incorporate both latrine construction and educational efforts and hygiene promotion, such as efforts to educate people about the significance of hand washing with soap. Educational and hygiene promotion efforts are particularly essential prior to latrine construction. This is primarily because people are unlikely to utilize newly constructed latrines if they are not properly educated about their benefits and not properly trained on how to maintain them.

Lunn (2000) indicates that people are more likely to use latrines if they are better constructed and better maintained. New latrines should be regularly monitored to ensure construction quality and maintenance. It is also essential to note that people often choose to build latrines because they enhance their social status. People feel embarrassed when their guests are forced to practice open defecation. People feel their households gain status if they have latrines and do not practice open defecation. These have a direct impact on sustainable behaviour change in communities where mobilizations are done. Further, Victoria et al. (2010) established that mobilization of communities to use pit-latrines had increased utilization among children less than 10 years. The current evidence however indicates that communities had been mobilized and sensitized on using toilets and hand washing with soap.

2.4.3 Supportive structures for the marginalized categories

Robinah, Kaddu and Mangen (2016) in a study done in Luwero district in Uganda, they found out those men in their study who defecated in the open stated that latrine use did not suite their daily routines, and that latrines were meant for females, as they stay at home most of the time and thus have more need for them. In general, users of latrines were viewed by study participants to be mainly women, especially the newlywed daughter-in-law.

Robinah et al., (2016) added that increase in building of latrines in rural Bamunanika, had the prime reason as arrival of the newly-wed bride in the household. Although there is no evidence of efforts to apply the Community-Led Total Sanitation approach as it had been undertaken elsewhere in the community or of social campaigns like ‘no toilet, no bride’ in the neighbouring sub counties, or use of messages around shame, dignity and security of females to promote latrine uptake, male heads of household and future husbands in our study showed more concern for protecting and preserving the dignity, privacy and security of their new daughter-in-law/bride when deciding to install a latrine. They did not want these young women to be seen while they defecated outside because it lowered the prestige of the family.

In contrast, in a study done in Indian and rural Puri society, Galan, Kim and Graham (2013) argued that similar thinking or motivations were not observed in regard to their daughters or other females within the family. Indian and rural Puri society is still male-dominated, household decisions are taken by men, and females’ needs are rarely attempted to be understood, recognized or addressed by male heads. Thus, policies aiming at empowering women in decision making could be fruitful in enabling females to demand for a life with dignity.

Galan et al., (2013) thus argued that female education and older age at marriage have been found to be key factors associated with greater empowerment of new daughters-in-law in decision-making and agency over their daily lives in their in-laws’ home and thus may be important elements of such policies.

Getachew (2010) adds that in many of the SF latrine households who tended to be wealthier or better educated upper caste families who had some prior exposure to latrines, daughters-in-law seemed to express gratitude for the ease and convenience of using the latrine (which typically always included a water supply and private place to bath), and for the liberation from worry of being publicly seen bathing as much as open defecating, a situation which could generate village gossip and family shame. On the other hand, married women subsidized latrine households who tended to be of low and middle castes with little outside exposure, going for open defecation in the evening provided many of them with one of the rare daily opportunities to escape the house, the scrutiny of the mother-in-law, and the confines of their hamlet and socialize with women friends and peers. This was most strongly expressed by married women who were daughters-in-law

(*i.e.* not yet mothers-in-law), and a few young ones expressed open regret for having to use the household latrine. This revealing finding is consistent with what some Indian researchers and experts have suggested, that the traditional role of women and rigid code of conduct for them within marriage, can be highly self-limiting, restrictive, and even boring, and contributes directly to the higher observed rates of depression among married women than married men across Indian society (Galan et al., 2013).

Okechukwu et al., (2012) also ascertained that with attainment of mother-in-law status and old age, women were less concerned about being seen open defecating. As roles in the household shift with mother-in-law status, and women gain greater freedom of movement and control over their daily routines compared to daughters-in-law, mothers-in-law may be more able to choose where they go and what they do. Other studies of subsidized latrine use have also found that older compared to younger married women in rural communities are more likely to defecate in the open. The exception to this pattern among older members was due to disability, immobility, or sickness which made open defecation difficult, similar to observations of reasons for early adoption in Benin and reported elsewhere in India.

A study in Tamil Nadu found women and men had different defecation sites (Galan et al., 2013), and the same was found in the study done in rural Puri. Unlike media reports from Northern India, there was little evidence that women saw or experienced going for open defecation as a safety problem or threat to their well-being. Social cohesion and fear of reprimand in the study villages appeared strong enough to prevent individual men from molesting women on their way to the open defecation sites.

While many studies of latrine use in rural India have observed a stronger tendency for adult women than men to use latrines (Okechukwu et al., 2012 & Galan et al., 2013). Heijnen & Peletz (2014) revealed contrasting preferences for open defecation and an unexpectedly complex diversity of views and attitudes towards latrine use held by rural women themselves, sometimes quite negative, which were found to vary with their age, marital status, caste, education, and role/status within the home. These insights suggest a universal preference among females in rural India for using latrines cannot be assumed, and that increased opportunities for social engagement and interaction outside the home for rural women, especially married women of lower socio-economic status, may need to be created so that open defecation no longer serves this purpose if rural women are to fully

embrace latrine adoption and use. Others have pointed to the need to increase understanding of the negative health implications of open defecation as important for behaviour change. Separate and concerted efforts focused specifically on how to change social norms of open defecation among rural men, given its greater convenience to them, will also clearly be needed (Heijnen&Peletz, 2014).

Lastly, Pattanayak et al. (2009); Arnold et al. (2010); Patil et al. (2014) found out that the likelihood of having a latrine was 1.5-fold higher with households that had a higher income than those with a lower income. This finding is in line with the results of a study conducted in 1999 in North Gondar, Ethiopia. The availability of a latrine was also affected by the frequency of supervision and distance of the household from the local health facility and Bahir Dar city. This could be because households located a short walking distance from the local health facility were better informed about the importance of building latrine facilities and its utilization through health-promotion programs and community mobilization, as was pointed out in studies in northern Ghana and Ethiopia (Ashebira et al., 2013)

In a study done in Rural Mali by Pattanayak et al. (2009); Arnold et al. (2010); Patil et al. (2014). This study provides rigorous evidence that a pure behavioural intervention with no monetary subsidies substantially increased utilization of latrines in rural Mali. Access to a private latrine almost doubled among households in CLTS villages (coverage increased to 65% in CLTS villages compared to 35% in control villages). Self-reported open defecation rates fell by 70% among adult women and men, by 46% among older children (age 5-10), and by 50% among children under five (Patil et al., 2014).

2.4.4 Awareness creation

Anteneh and Kumie (2010) in a study done in Ethiopia on literacy related factors behind utilization of latrines; established that many of community members who were not utilizing toilets lacked required knowledge on the importance of these latrines. Anteneh and Kumie (2010) further showed that educational level of the respondents has a significant association with latrine utilization. The finding of this study is supported by other similar study conducted on the impact of sanitation intervention on latrine coverage and uses a worldwide report that means education level has an effect on the community latrine utilization (Maggie et al., 2010). This might be due to that education has a significant influence on human

behavior towards behaving health activities. Similarly, Sara (2014) argues that as peoples' educational status increases, their knowledge on the disease causation, transmission and the role of human waste to the occurrence of communicable diseases increases. Therefore, to keep their health well they manage and dispose of every type of wastes (including human excreta) safely wherein properly constructed latrine.

On the contrary to this study, Tefera (2008) ascertained that educational status of the respondents (head of the household) does not have any significant association with latrine utilization in one study conducted in Nepal. This might be due to the fact that even though slightly more than half of the participates were illiterate (51.7%), the government of Nepal is committed to improving sanitation throughout the country, one priority campaign is improving latrine coverage towards attaining open defecation free areas all over the country by 2017 Anteneh and Kumie (2017). Despite the fact that a lot of activities and strategies (like training manpower, ONE WASH, Health Extension Package and Community Lead Total Sanitation and Hygiene Behavioural Change) have been conducted in the country Ethiopia, latrine utilization has remained one half of the country's vision which was 100% basic sanitation (including proper latrine utilization).

2.4.5 Establishment of management committees

According to Waterwiki (2010) training sanitation committees in communities is a very essential step towards achieving sustainable behaviour change towards latrine utilization in rural communities. Tyndale-Biscoe et al. (2013) indicates that the training of sanitation committees improved household sanitations. They resurveyed households from villages in Ethiopia and Ghana one year after implementation of sanitation interventions ended to assess if sanitation outcomes were sustained. In the year after implementation ended, reductions in open defecation were sustained. Only one intervention saw reversion back to open defecation. The average reversion rate in this study was lower than seen in a previous Plan International study in Ethiopia, Kenya, Uganda, and Sierra Leone, in which 13% of households reverted to open defecation in the two-plus years since the training of sanitation committees had ended (Tyndale-Biscoe et al., 2013). However, these reversion rates are not necessarily inconsistent with David et al (2014), as they used a longer follow-up period, and reversion to open defecation may not be a linear process. They also may have overestimated reversion, as they assumed that "open defecation free" status as verified by local government was an accurate measure, which may not be true.

Cavill et al., (2014) further indicated that sometimes finding of no reversion in behaviour for three interventions is striking. The majority of latrines in study villages were unimproved, which in this case means their floors and slabs were made of low durability local materials. Sanitation interventions often results in low durability latrines made of local materials, which is frequently cited as causing reversion to open defecation (Cavill et al., 2014). Better market access may help prevent this—in Ghana, where study villages were wealthier and closer to markets, 81% of latrines had intact superstructures offering complete privacy, whereas in Ethiopia only 6% did. Many households in this study had latrines fall into disrepair or collapse in the year following implementation— 45% in Ethiopia and 6% in Ghana—but they repaired or rebuilt them in the same year with the presence of sanitation committees. The high repair rates likely indicate a social norm around latrine use, given that the influence of external facilitators and the incentive of pending ODF certification were gone. While households were clearly committed to continued latrine use (demonstrated by latrine repair rates), a 45% annual latrine disrepair/collapse rate seems likely to discourage households and eventually push them back to open defecation. The subsequent sustained latrine use varied more by region than by intervention, indicating that context may be as or more important than the implementation approach in determining effectiveness. In both Ethiopia and Ghana, the interventions were most effective and the impacts most sustained in remote villages, which were poorer, had higher baseline open defecation, lower prior exposure to WASH projects, and indicators of potential social cohesion (such as being smaller and having lived together longer).

Training of sanitation committees prevent the prevalence of contamination from man-made pollution and waste to naturally occurring toxins and the wide range of ways contaminated water can enter the human body are staggering. Everyday people are put at risk through drinking contaminated water, eating food prepared in bowls or with utensils washed with contaminated water, through poor personal hygiene, bathing and washing in unhygienic water (Jailson et al, 2015). Maxwell et al (2010) conducted a study in Luanda, Angola and evidence showed factors affecting quality of care given by caregivers and their ability to maintain a hygienic environment—include the availability of water and sanitary facilities was lack of sanitation committees to oversee the overall programme. The toilet facilities available to Accra’s population are mainly public latrines (54 percent) and private improved pit latrines (20 percent). Only 10 percent of households had flush toilets

at the time of the study, and 16 percent did not have or use any toilets at all (that is, they used empty lots and gutters). Maxwell et al (2010) stated in their study that improvements in sanitation reduce the transmission of pathogens that cause diarrhoea by preventing human faecal matter from contaminating environments. Improving sanitation facilities has been associated with reduction in diarrhoea incidence of 36 per cent across reviewed studies.

2.5 Challenges being experienced in enforcing sanitation practices in communities

2.5.1 Soil structure constraints

Awoke and Muche (2013) have criticized the single model technology and pointed at the structural deficiencies in the subsidy driven sanitation intervention promoted by the government. Although participants did not mention this explicitly, their non-involvement in shaping the toilet design to suit their needs and preferences may have been a strong reason for discarding their subsidized latrines in our study area. This phenomena was observed elsewhere in rural Kenya in which people who had not been involved in choosing their sanitation technology persisted in their habit of open defecation, and has been confirmed in a quantitative study showing individuals in households that had been involved in the choice of their latrine design were 49 % less likely to practice any OD than members of households that had not (Coffey et al., 2014). They added that the TSC GOI's individual household latrine unit design of 5 feet wall height, single cubicle, and single shallow pit pour flush latrine with no roof and no water provision and, in many cases, with doors missing, was regarded by people as incomplete and insufficient for use.

Getachew (2010) indicated that among the study population of rural Odisha, however, it was found out that people not using a GOI subsidized latrine even if complete (as per government guidelines) and functional but lacking a roof. Owners expected to receive more subsidies sometime later, so delayed using the facility, or completing the facility at their own costs. The long history of experience with hardware subsidies in sanitation programming has shown that toilet construction subsidies do not guarantee that toilets will be used and are a poor substitute for creating real demand. As per TSC guidelines, the subsidy was meant as an incentive for backward families, which was to be reimbursed only after the completion of the toilets. High reliance on the subsidies however has been observed among rural Indian families, and the subsidy amount reported as inadequate to

construct an acceptable functional sanitation system. In contrast, there is evidence of poorer households achieving higher levels of sanitation on their own.

2.5.2 Availability of local construction material

Coffey et al. (2014) further ascertained that lack of provision for any water supply in the units emerged as a major factor for non-use in the design of facilities in the study setting, given the quantities of water needed for anal cleansing, flushing and sanitation purification rituals. Participants were optimistic that usage would increase among existing GOI subsidized latrine households with provision of water in the latrines. These findings corroborate those of other Pakistan studies in Rajasthan (Bayu, 2015) which found that absence of water at the latrine for post-defecation anal cleansing and bathing (which is crucial to accomplish customary sanitation purification rituals described above) reduced latrine uptake and use. In places where the distance of water supply points was more than 500metres from the latrine, villagers have shown unwillingness to fetch water (Coffey et al., 2014). In rural Madhya Pradesh, lack of a water connection was the second most frequent reason (excluding lack of money) for not having a toilet facility (Getachew, 2010).

In a study using the Safe San Index to measure consistent latrine use in Puri District, a water source in the latrine was associated with a 2 fold increase in safe excreta disposal rates (*i.e.*, defecation and disposal in the latrine) across all members, compared to latrine owners with a public water source located outside the compound (Elmendorf & Buckles, 2017). Water requirements for cleansing and purifying rituals mean that unavailability of water supply in sanitation facilities will continue to be a major shortcoming of the subsidized latrines, unless addressed. O'Reilly et al. (2013) in taking a politically ecology approach to understanding sanitation adoption in rural Indian, has argued for the critical importance of inaccessibility of water as an important ecological and structural constraint to be addressed. A global review of determinants of rural latrine use and open defecation behaviour has also highlighted the importance of accessible and reliable water availability as a factor in latrine adoption. People will continue to do what was convenient and easy and open defecate near local surface water bodies (ponds and rivers) (Gopal et al., 2009).

2.5.3 Cultural practices

Although lack of finance and poor quality of government's subsidized latrines are constraints for not adopting latrines, our results show that primarily old habits and strongly ingrained beliefs around impurity and pollution and the required rituals for purification and cleansing post-defecation in societies may play a big part in the choice to continue defecating in the open in the study area. Faeces have always been considered ritually impure as well as physically filthy and water as the necessary medium of purification and ritual cleansing in society (Bonu & Kim, 2009). Bathing and clothes changing rituals are deeply ingrained practices post-defecation and after many other kinds of ritual defilement in Indian society (O'Reilly & Louis, 2014).

Together these cultural beliefs and practices explain the strong importance households have placed on the need for water provisioning inside the latrine to accomplish required cleansing acts following defecation (Jenkins, 2016). Ritual pollution may extend to simply touching or entering the latrine for some higher castes (Banda, Sarkar, Gopal, Govindarajan, Harijan & Jeyakumar, 2017), as was described by Brahmin participants in the SF latrine group. This clearly poses a considerable barrier to safe child faeces disposal in the latrine as well as latrine cleaning if elaborate water purification rituals are perceived to be too time-consuming or difficult to perform, added to arguments for providing water availability in the latrine. This possibility is supported by findings from a survey of child faeces disposal practices in rural Indian households with a functioning latrine, that water availability on the premise for using the latrine was associated with safe child faeces disposal (Bhattacharya, Joon & Jaiswal, 2011).

Beliefs that faeces are impure also caused a few participants to consider the practice of containing faeces in the latrine pit in the house as a 'sin', because idols and pictures of gods that are revered are kept and worshipped in every house; having toilets within or next to the house makes the entire house impure. These kinds of strong traditional beliefs can hold back people from adopting the new practice of defecating safely inside latrines (O'Connell, 2014). The importance of considering cultural beliefs, however, has long held true for changing sanitation around the globe (Hammer et al., 2013).

2.5.4 Prevailing attitudes

Pattanayak et al. (2009) conducted a study in Northwest Frontier province of Pakistan border Afghanistan, with 85% of the rural population. The key person of the population including local politicians, village elders and imams were interviewed. It was found that more than 10 million people were practicing open field defecation which is a potential cause of outbreak of diseases. This was explained by the belief among the community members that open field defecation is not avoidable due to the cost of toilets in the place.

In another study conducted to understand the knowledge, attitudes and practices of sanitation and defecation in Iteso Region in Uganda, Kaddu and Mangen (2016) found out that among 97 households interviewed, only 25 (83.3%) use sanitary latrine. Seventy-two (74.2%) of respondents defecated in fields, and there was no stigma associated with this traditional practice. Hand washing with soap after defecation and before meals was common only in children under 15 years (86.4%).

While traditional habits and socio-cultural barriers may be contributing to the present-day situation, several studies and reports have drawn attention to serious problems in the toilet programme design and implementation. Mara, Lane and Scott (2010) argued that inadequate inefficient programme implementation, unprofessional and ad-hoc target-making and inadequate institution buildings are also some of the reasons contributing to unchanging traditional behaviour. They also found substantial problems with inadequate and inappropriate design and incomplete and sometimes poor-quality construction of the TSC subsidized latrines which posed real barriers to latrine use. For example, near-annual risks of monsoon flooding and widespread inundation in the Puri district study area were not considered in the design and construction of the subsidized latrines, many of which had pans installed at or near ground-level and very small, shallow pits compared to SF latrines in the same communities (which typically had elevated pans and large pit volumes).

As a result, many of the subsidized toilets were inundated or water-logged, and unusable in the rainy season. In their study across rural north India, Coffey et al. (2014) also found that SF latrines had significantly larger pits than GOI subsidized latrines, and that latrines used by all household members were much more likely to have larger pits than those used only by some or few members. A desire for large dry pit volumes has also been observed in Africa, the motivation expressed being to maximize the investment in building the

structure and serve the whole family for many years before the pit becomes full and has to be replaced.

In Tanzania, a study revealed that shared latrines provided as much protection compared with private latrines regarding risk of trachoma. There was no link between sharing latrines and trachoma transmission even in homesteads where latrines were shared among many households (Maggie et al., 2015)

2.5.5 Availability of space for construction of sanitation facility

In a study conducted by Dewey and Mayers (2011), disposal strategies call for mobilizing communities to ensure that faecal is well disposed off in latrines, and other wastes in dustbins as well as mechanisms in place to handle such wastes after disposal at household level. Dewey and Mayers (2011) found out that this had improved on the hygiene and sanitation behaviours of people in northern India. In addition, Bethony, Brooker, Albonico, Geiger, Loukas, Diemert, and Hotez (2006) in their study about the contribution of mobilizing communities to ensure that faecal is well disposed off clearly on improving sustainable behaviour change. They established that this had made improvements in using of latrines and increasing child growth and diarrhoea-related mortality which were observed. One explanation for this finding is that the when communities are well sensitized, it reduces child exposure to faecal contamination, through reduction in open defecation and/or improvements in hand hygiene behaviour. Lower levels of environmental faecal contamination could potentially contribute to less environmental enteropathy among children, a subclinical condition characterized by poor nutrient absorption in the gut and associated with stunting in children (Lunn 2000; Campbell, Elia, and Lunn 2003).

Currently, 1.1 billion people worldwide poorly dispose-off wastes according to UNICEF (2012) which has expanded on the exposure to poor hygiene, inadequate quantities and quality of drinking water and lack of sanitation facilities cause millions of the world's poorest people to die from preventable diseases each year. Women and children are the main victims. The link between water, sanitation and diarrhoea include: - contaminated water that is consumed may result in waterborne diseases including viral hepatitis, typhoid, cholera, dysentery and other diseases that cause diarrhoea. Without adequate quantities of water for proper hygiene, skin and eye infections for example trachoma

spread easily (WB, 2013). In some areas like Turkana, the prevalence rate of diarrhoea is 42% (AMREF, 2011).

In a study done by Curtis et al (2013), it was established that when communities are not adequately sensitized to dispose waste, this has a long-term impact on the general hygiene in the whole community. Looking at the need to improve existing sanitation, Curtis et al., (2013) undertook a study that showed that improving domestic hygiene practices is potentially one of the most effective means of reducing the global burden of diarrheal diseases in children. If hygiene promotion is to succeed, it needs to identify and target only those few hygiene practices which the major source of risk in any setting are. It added that any behaviours which prevent stools from getting into the domestic arena, the child's main habitat, are likely to have a greater impact on health than those practices which prevent pathogens in the environment from being ingested. Hence safe stool disposal, a primary barrier to transmission, may be more important than hand-washing before eating.

2.6 Summary of the literature review

The literature reviewed clearly indicates that there are several studies in place that viably established the factors indicating slow progress in sanitation achievement world over. Most of the literature reviewed was for studies done in previous years of 2017 and below, also not in Moroto district. Considering new developments, there is need to carry out further study in sanitation since several gaps are glaring as per the review above. Another study would empirically test the literature reviewed and weigh the progress of sanitation interventions or programs in place. This revealed new endeavours in place especially on the influence of sanitation interventions on sustainable sanitation behaviour change in Nadunget sub-county, Moroto district, Uganda.

CHAPTER THREE: METHODOLOGY

3.0 Introduction

This chapter describes how the study was conducted by presenting the; study design, study area, study population, sample size calculation, sampling techniques, sources of data, study variables, data collection techniques, data collection tools, data management and analysis measures, quality control procedures, ethical considerations and plan for dissemination.

3.1 Study Design

The study was a cross-sectional study that employed both quantitative and qualitative approaches to generate adequate data for the assessment of adoptability to sanitation practices among communities in Nadunget sub-county, Moroto district. This study design was the most appropriate since it involved collection of data at a one point in time. The quantitative component generated discrete data whereas the qualitative component generated descriptive data generalizable to the study population (Weinreich, 2000).

The quantitative component constituted definite quantified answers that helped to assess the adoptability to sanitation practices through the responses given by the individuals at household level. The qualitative aspect involved conducting in-depth interviews to understand the perceptions of selected local leadership and local government staff on adoptability to sanitation practices. This triangulation of methods was important in crosschecking data, explaining the behaviours and thus gave a more detailed and balanced picture of the situation.

3.2 Study Area

Moroto district is a district in the North-Eastern Uganda. The town of Moroto is the site of the district headquarters. Moroto district is bordered by Kaabong district to the north, Kenya to the east, Amudat district to the south, Nakapiripirit district to the southwest, Napak district to the west, and Kotido district to the northwest. Moroto town, where the district headquarters, is at the foot of Mt. Moroto. The town of Moroto is approximately 213 kilometres (132 mi), by road, northeast of Mbale, the nearest large city. This is about 434 kilometres (270 mi), by road, northeast of Kampala, the capital and largest city of Uganda. Moroto district is part of the larger Karamoja sub-region. Moroto district is characterized by rocky mountainous landscape with moderately low rainfall. It is composed of three counties: Bokora county, Matheniko county, and Moroto municipality.

It is inhabited by the Karimojong, a distinctive ethnic group that highly cherishes its traditions. The district is a hub of mineral resources that are yet to be optimally exploited. In August 2014, the national census and household survey enumerated the population at 103,432.

Geographical Scope

Nadunget sub-county is comprised of 6 Parishes; Nadunget, Naitakwae, Lotirir, Loputuk, Komaret and Acerer. The study was carried out in three parishes of Nadunget, Naitakwae and Loputuk which were randomly selected.

3.3 Study Population

The study population comprised of households in Moroto and targeted the households in three selected parishes; Nadunget, Naitakwae and Loputuk in Nadunget sub-county

Eligibility Criteria

3.3.1 Inclusion Criteria

A respondent was a household head or any responsible person in a household and would be included in the study only if he or she was 18 years and above residing in any of the three selected parishes in Nadunget sub-county. Participation was by only those who consented

3.4.2 Exclusion Criteria

All people that were visiting and those members that were staying in the selected parishes of Nadunget, Naitakwae and Loputuk for less than a year were excluded from the study. All those who did not consent to participate were excluded. All those below 18 years.

3.4 Sample Size Determination

The number of respondents in the study was determined using Kish and Leslie formula of 1965; preferred because it is best suited for infinite populations.

The formula states;

$$n = \frac{Z^2 pq}{e^2}$$

Where: Z = standard normal deviation at the required Confidence Interval of 95%

$Z = 1.96$ at 95% Confidence Interval

$e =$ standard error allowed at 95% Confidence Interval = 0.05

$p =$ Sanitation coverage in Moroto was 15.5%

Hence $p = 0.155$

$q = 1 - 0.155 = 0.845$

$$n = \frac{(1.96)^2 (0.155 \times 0.845)}{0.05^2}$$

$n = 201$; with 10% non-response rate 201×0.1 gives 20

Therefore, the required sample was $201 + 20 = 221$ respondents

The sample constituted **221 households** in Nadunget sub-county, Moroto district.

Study Unit

The unit of study was a household in Nadunget sub-county.

3.5 Sampling procedures

The study area (Moroto district) was purposively selected because it had the lowest sanitation coverage in Karamoja sub-region.

3.5.1 Selection of parishes

Parishes were selected using simple random sampling method. All the six parishes were listed to constitute the sample frame. The names of these parishes obtained from records at the sub-county were written on pieces of paper, folded, put in a container and closed. The contents of the container were shaken several times to ensure a good mix or randomization of the pieces of paper. The three parishes were then picked at random one after the other. Nadunget Parish, Naitakwae and Loputuk were randomly selected.

3.5.2 Selection of Household heads

The number of households per parish was noted as follows; considering Nadunget (1601 households), Naitakwae (1179 households), and Loputuk (1683 households) as per sub-county records, proportionate sampling was used to determine the number of households to be considered for the survey as illustrated below;

Table 1 Sample Frame of household distribution by Parish

S/N	Selected parishes	Total number of households (a)	Desired sample number of households (c) $c = (a/b) * n$ <i>Equation 1 Household distribution per Parish</i>
1	Nadunget	1601	79
2	Naitakwae	1179	59
3	Loputuk	1683	83
Total	3	4463 (b)	221(n)

Systematic sampling was then used to select the households. The starting household was randomly selected then other using a fixed sampling interval (K^{th} factor) derived from dividing the total number of households in the study area by the sample size.

Number of Households in Nadunget subcounty = 4463

Sample size 221

K^{th} factor = $4463/221 = 20$. The respondents were selected at intervals of 20 households.

3.5.3 Selection of Respondents for the qualitative study

Purposive sampling technique was used to select key informants who were (5) local leaders from the parishes but belonging to the village and parish sanitation committees or with experience in safe sanitation promotional activities in villages. Also, five (5) selected technical staff at sub-county, district and CSO level were interviewed.

3.6 Sources of Data

The main sources of data were household heads and also Village Chairpersons (3), Parish Councillors, Parish Chief (2), Community Development Officer, District Health Officer and the WASH Program Manager for Save the Children.

3.7 Study Variables

3.7.1 Dependent Variable

The dependent variable in this study was **Adoptability to sanitation practices** and measured in terms of;

Sanitation facilities constructed

Level of use of sanitation facilities

Extent of open defecation free areas

3.7.2 Independent Variables

The following independent variables were considered to assess the factors affecting adoptability to sanitation practices.

a) Responsiveness to sanitation practices constituting;

Human excreta disposal method

Use of toilet facilities

Owning toilet facilities

Type of toilet facility

Cleaning responsibility for toilet facility

Motivation for good sanitation

b) Undertakings by community involving;

Existence of norms/bylaws

Community mobilization efforts

Supportive structures for the marginalized categories

Awareness creation

Establishment of management committees

c) Challenges faced by communities comprising of;

Soil structure constraints,

Availability of tools

Availability of local construction material,

Cultural practices

Prevailing attitudes

Availability of space for construction of sanitation facility

3.8 Data collection tools

Quantitative tool

A close ended researcher administered questionnaire was used to collect quantitative data from the sampled household heads.

Qualitative tool

A key informant guide was used to collect qualitative data from Village Chairpersons (3), Parish Councillors, Parish Chief (2), Community Development Officer, District Health Officer and the WASH Program Manager for Save the Children.

3.9 Data collection Techniques

A researcher administered questionnaire was used to collect data from household heads. The questionnaire consisted of 5 parts. Part one contained questions on the characteristics of the respondents, part two questions on factors for responsiveness to sanitation practices. Part three questions on community undertakings for sanitation practices, part four consisted of questions on challenges to promotion of sanitation practices among the communities and finally the fifth part questions on adoptability to sanitation practices. The questions were translated in the local language for respondents who did not understand English.

A key informant (KI) guide consisted of 5 questions for the selected local leaders together with sub-county, CSO and district staff. The questions covered several issues affecting adoption of sanitation practices.

3.10 Data Analysis Procedure

Analysis of quantitative data

All questions were pre-coded before data entry and entered in Epi data version 3.1. Editing of data and corrections was done immediately at the end of each data collection day to rule out any missing data and other inconsistencies. Double data entry was done using Epi data version 3.1 and data cleaned to reduce chances of errors made during the entry. To eliminate error further, all categorical question coding was put in checks and then exported to SPSS version 22.0 (Statistical Package for Social Sciences) for analysis.

Analysis was done in three main phases. The first phase presents frequency distribution tables of all independent variables with their corresponding percentages and adoptability to sanitation practices presented using a pie-chart. The second phase presents the chi-square test using bivariate analysis at 95% confidence interval.

The third phase provides a combination of factors that determine impact of each independent variable on adoptability to sanitation practices. These results were then presented inform of Odds Ratio at 95% level of confidence.

Analysis of qualitative data

Data collected from key informants was transcribed from the audio recordings and further analysis done using coded word-processed text organized and analysed using content and factor analysis with ATLAS/TI software.

Data was divided into meaningful analytical units and marked with descriptive words under themes aligned to the research objectives. Content from each category was summarized and reported in verbatim. A 10% back translation was done for quality control.

3.11 Quality Control Measures

Data quality in this study was ensured by pre-testing the data collection tools and instruments for relevance and consistence. The section therefore presents how validity and reliability were ascertained.

3.11.1 Validity

The researcher used the expert judgment of the supervisors to verify the validity of the instruments. Two supervisors were contacted to evaluate the relevance of each item in the instruments to the objectives. The experts rated each item as either relevant or not relevant. Validity was determined using Content Validity Index (C.V.I). C.V.I = Items rated relevant by both judges divided by the total number of items in the questionnaire as shown hereinafter.

$$CVI = \frac{\text{No. of items rated relevant}}{\text{Total no. of items}}$$

Equation 2 Content Validity Index

As recommended by Amin (2005), for the instrument to be valid, the C.V.I should be at least 0.7

3.11.2 Reliability

To establish reliability, the instruments were pilot-tested twice on the same subject at a time interval of four weeks. The results from the pre-test were used to modify the items in the instruments.

Training of research assistants

A total of 5 research assistants were recruited and trained on how to collect data. The data collection tools were studied and translated into local language to ensure consistency with the ones in English. The researcher supervised the research assistants during data collection and crosschecked whether the questionnaires were fully filled as required.

3.12 Ethical Considerations

Unique identification numbers were assigned to each respondent's questionnaire to ensure that any particulars are not revealed. Also, each respondent's information and any data gathered from each of them was kept, only accessible to researcher and thus only used for the study. Data from each selected household was analysed generally as data from villages rather than name of the village.

Permission and approval to conduct the study was obtained from Clarke International University-Uganda and Moroto district leadership.

Informed consent was obtained from respondents after explaining adequately the aim, procedures and anticipated benefits of the study. The study participants were made aware that their participation was voluntary with no payment involved and were free to withdraw consent at any time during the study.

3.13 Plan for Dissemination of the report

This research paper was submitted to Clarke International University for examination and approval and made available in the CIU library for references. Copies were also made available to Moroto District Local Government, Uganda Ministry of Water and Environment and a publication made online in the peer review website.

3.14 Limitation of the study

The respondents, most of them as per the findings were low income earners, it could be possible that their responses may have been from expecting a later reward of distribution of food or non-food items. The possibility of failure by respondents to correctly interpret the questions. Respondents withholding information for fear of incrimination in the cases of existing bylaws.

CHAPTER FOUR: PRESENTATION OF STUDY RESULTS

4.0 Introduction

This chapter presents the research findings with demographic characteristics of the respondents, followed by the bivariate analysis of the demographic characteristics and adoptability to sanitation practices, adoption of sanitation practices by communities in Nadunget, responsiveness to sanitation practices among communities in Nadunget; undertakings to improve sanitation practices by communities in Nadunget and challenges met in promoting sanitation practices in Nadunget sub-county. Finally, it also presents the multivariate analysis of a combination of factors that determine impacts of each independent variable on adoptability to sanitation practices among the communities in Nadunget sub-county, Moroto district. A total of 221 respondents voluntarily consented to participate and all of them were enrolled by the researcher into the study implying a 100% response rate.

4.1 Demographic characteristics of the respondents.

Table 2 Univariate analysis of demographic characteristics

Variables	Responses	Frequency n=221	Percentage (%)
Age	18-25 years	62	28.1
	26-35 years	66	29.9
	36-45 years	24	10.9
	46-55 years	8	3.6
	56-65 years	41	18.6
	66 years and above	20	9.0
Sex	Male	38	17.2
	Female	183	82.8
Religion	Muslim	11	5.0
	Catholics	200	90.5
	Protestants	6	2.7
	Born again	2	0.9
	Others	2	0.9
Level of education	non-formal education	158	71.5
	Primary	53	24.0
	Secondary	4	1.8
	Tertiary	6	2.7
Occupation	Peasant farmer	168	76.0
	Business	18	8.1
	Housewife	35	15.8
Monthly income	<50,000	157	71.0
	50,000-100,000	24	10.9
	101,000-150,000	15	6.8
	>200,000	5	2.3
	Don't earn	20	9.0
	Total	221	100.0

Source primary field data 2018

The frequency distribution of demographic characteristics presented in table 2 above show that the majority 66(29.9%) of the respondents were aged 26 to 35 years while the least in number 8(3.6%) constituted those aged 46 to 55 years. The majority 183(82.8%) of the participants were female and only 38(17.2%) male. Regarding religious affiliation, almost all 200(90.5%) of the respondents were Catholics and only 21 (9.5%) belonged to other religious denominations. The level of education of respondents showed that the majority 158(71.5%) had not attained formal education and only 10(4.5%) had had secondary/tertiary education. With reference to occupation, the majority 168(76.0%) of the respondents were peasant farmers and only 18(8.1%) business persons, the others were housewives. In addition, the majority 157(71.0%) earned less than 50,000 per month while only 5(2.3%) earn more than 200,000 per month.

Bivariate analysis of demographic characteristics and adoptability to sanitation

Table 3 Bivariate analysis of demographic factors

Variables	Responses	Adoptability to sanitation practices		X ²	P-value
		Yes	No		
Age	18-25 years	26(25.5%)	36(30.3%)	16.175	0.006
	26-35 years	25(24.5%)	41(34.5%)		
	36-45 years	18(17.6%)	6(5.0%)		
	46-55 years	7(6.9%)	1(0.8%)		
	56-65 years	17(16.7%)	24(20.2%)		
	66 years and above	9(8.8%)	11(9.2%)		
Sex	Male	23(22.5%)	15(12.6%)	3.814	0.051
	Female	79(77.5%)	104(87.4%)		
Total		102(100.0%)	119(100.0%)		
Religion	Muslim	8(7.8%)	3(2.5%)	13.545	0.009
	Catholics	85(83.3%)	115(96.6%)		
	Protestants	6(5.9%)	0(0.0%)		
	Born again	2(2.0%)	0(0.0%)		
	Others	1(1.0%)	1(0.8%)		
Level of education	Non-formal education	68(66.7%)	90(75.6%)	3.448	0.486
	Primary	29(28.4%)	24(20.2%)		
	Secondary	2(2.0%)	2(1.75)		
	Tertiary	3(2.9%)	3(2.8%)		
Occupation	Peasant farmer	87(85.3%)	81(68.1%)	11.799	0.003
	Business	8(7.8%)	10(8.4%)		
	Housewife	7(6.9%)	28(23.5%)		
Monthly income	<50,000	75(73.5%)	82(68.9%)	20.09	0.000*
	50,000-100,000	15(14.7%)	9(7.6%)		
	101,000-150,000	10(9.8%)	5(4.2%)		
	>200,000	0(0.0%)	5(4.2%)		
	Don't earn	2(2.0%)	18(15.1%)		
Total		102(100.0%)	119(100.0%)		

Source primary field data 2018 ** statistically significant at $P < 0.05$

The bivariate results presented in table 3 shows association between demographic factors and adoptability to sanitation practices. However findings established the following factors as those having a significant relationship; age ($X^2=16.175$, $p=0.006$), religion ($X^2=13.545$, $p=0.009$), occupation ($X^2=11.799$, $p=0.003$) and household monthly level of income ($X^2=20.09$, $p=0.000$).

4.2 Adoption to sanitation practices among communities in Nadunget

Table 4 Frequency distribution of adoptability factors to sanitation practices

Variables	Responses	Frequency n=221	Percentage (%)
All Household members access latrines	Yes	109	49.3
	No	112	50.7
	Total	221	100.0
Using latrine is better than bush	Yes	171	77.4
	No	50	22.6
	Total	221	100.0
Have tippy taps at household latrine	Yes	53	24.0
	No	168	76.0
	Total	221	100.0
Soap and ash for washing hands after visiting toilet	Yes	88	39.8
	No	133	60.2
	Total	221	100.0
Village declared open defecation free	Yes	114	51.6
	No	107	48.4
	Total	221	100.0

Source primary field data 2018

Regarding to the adoptability factors, almost a half 109(49.3%) of the respondents reported that all their household members have access to latrines, the majority 171(77.4%) agreed that using latrine is better than going to the bush. Almost a quarter 53(24.0%) have tippy taps at household latrine, more than a quarter 88(39.8%) reported availability of soap and ash for hand washing after visiting toilet and a half 114(51.6%) of the respondents indicated that their village had been declared open defecation free.

Figure 2 Adoption to Sanitation practices

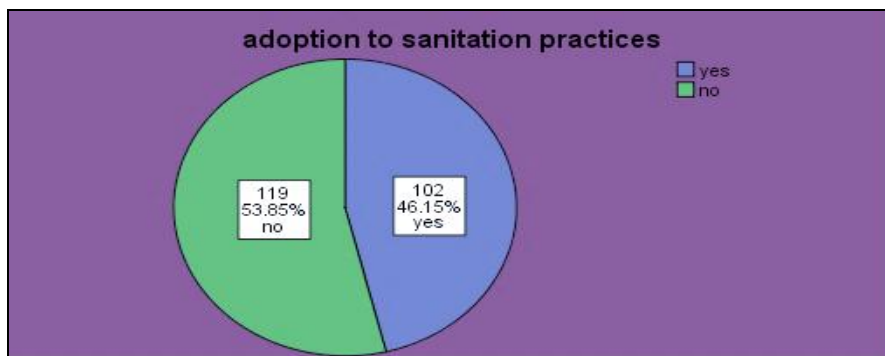


Figure 2 above shows the overall adoptability to sanitation practices whereby 102 (46.15%) of the households had adopted good sanitation practices and 119 (53.85%) had not yet adopted good sanitation practices. This was obtained by computing indicators used to measure adoptability to sanitation practices indicated in table 3 above employing the variable transformation command in SPSS.

Further findings from Key Informants

Do all village members have access to toilets/latrines facilities in Nadunget sub-county?

Generally, majority of the all village members do not have access to toilet and latrines facility (KI, CDO, sub-county chief). The reason stated; save the children works with few villages in the Nadunget sub-county and other organizations like caritas works with others. However, contradicting statements included; not all have access to latrines, but its coverage is 40% (parish chief). All members in the village have access to latrine but the attitude towards its use low.

4.3 Responsiveness by communities towards adoptability to sanitation

Table 5 Univariate analysis of responsiveness

Variables	Responses	Frequency n=221	Percentage (%)
Sanitation facility of disposal	Yes	105	47.5
	No	116	52.5
Who persuaded you to have your own latrine	Cultural leaders	25	11.3
	Neighbours	25	11.3
	LC1	24	10.9
	Village health team	9	4.1
	Schools	3	1.4
	District /NGOs	19	8.6
	Not applicable	116	52.5
Which facilities	Pit latrines	99	44.8
	Ventilated improved pit latrines	6	2.7
	Not applicable	116	52.5
How do you dispose-off human excreta	Cat method	13	5.9
	Bush	97	43.9
	Others	6	2.7
	Not applicable	105	47.5
Hand washing facility	Yes	69	31.2
	No	152	68.8
Household participate	Yes	123	55.7
	No	98	44.3
Who always clean	Father	31	14.0
	Mother	35	15.8
	Children	22	10.0
	Others	35	15.8
	Not applicable	98	44.3
Are children faeces dispose-off in latrines	Yes	99	44.8
	No	122	55.2
Who is responsible for cleaning the latrine facilities	Father	20	9.0
	Mother	44	19.9
	Children	17	7.7
	Others	18	8.1
	Not applicable	122	55.2
Using toilet is a primary prevention of diarrhoea	Strongly agree	200	90.5
	Strongly disagree	21	9.5
What motivates good sanitation	Susceptibility to diarrheal diseases	110	49.8
	Severity of diarrheal diseases	49	22.2
	Benefit of good sanitation	41	18.6
	Not applicable	21	9.5
	Total	221	100.0

Source primary field data 2018

According to frequency distribution of responsiveness factors, less than half 105(47.5%) of the respondents indicated having sanitation facilities for disposal of human excreta while more than a half 116(52.5%) did not have sanitation facilities. However, among those who had sanitation facilities 25(11.3%) indicated that they were persuaded by cultural leaders and 3(1.4%) were persuaded from school. The sanitation facilities available included pit latrines 99(44.8%) and 6(2.7%) ventilated improved pit latrines. In addition, respondents who did not

have sanitation facilities disposed-off their human excreta using the cat method 13(5.9%), 97(43.9%) bush and 6(2.7%) indicated other methods.

Less than a quarter 69(31.2%) of the respondent had hand washing facilities available at their latrines.

The study also established that more than a half 123(55.7%) of the respondents agreed that their household members participate in cleaning sanitation facilities. Among those who participated in cleaning; the mothers 35(15.8%), fathers 31(14.0%), children 22(10.0%) and others 35(15.8%). Less than a half 99(44.8%) of the respondent revealed that children faeces are disposed-off in latrines while the majority 122(55.2%) disposed in other places. The people responsible for children faeces disposal includes mothers 44(19.9%), 20(9.0%) fathers, children 17(7.7%).

Almost all 200(90.5%) of the respondents strongly agreed that using latrine/toilet is a primary prevention of diarrheal disease while only 21(9.5%) of them disagreed. Susceptibility to diarrheal diseases motivated 110(49.8%) of the respondents to have good sanitation facility, 49(22.2%) showed severity of diarrheal diseases and 41(18.6%) benefit of good sanitation facility as their motivating factor respectively. Results presented as not applicable were for those who did not have the facilities.

Bivariate analysis of responsiveness and adoptability to sanitation practices by communities in Nadunget

Table 6 Bivariate analysis of responsiveness factors

Variables	Responses	Adoptability to sanitation practices		X ²	P-value
		Yes	No		
Sanitation facility for disposal of faeces exists	Yes	66(64.7%)	39(32.8%)	22.458	0.000*
	No	36(35.3%)	80(67.2%)		
Who persuaded you to have your own latrine	Cultural leaders	14(13.7%)	11(9.2%)	30.056	0.000*
	Neighbours	15(14.7%)	10(8.4%)		
	LC1	16(15.7%)	8(6.7%)		
	Village health team	8(7.8%)	1(0.8%)		
	Schools	3(2.9%)	0(0.0%)		
	district/NGOs	11(10.8%)	8(6.7%)		
	Not applicable	35(34.3%)	81(68.1%)		
Which sanitation facilities do you have	Pit latrines	55(53.9%)	44(37.0%)	8.389	0.015
	VIP latrines	4(3.9%)	2(1.7%)		
	Not applicable	43(42.2%)	73(61.3%)		
How do you dispose-off human excreta	Cat method	11(10.8%)	2(1.7%)	23.552	0.000*
	Bush	29(28.4%)	68(57.1%)		
	Others	2(2.0%)	4(3.4%)		
	Not applicable	60(58.8%)	45(37.8%)		
Hand washing facility at household latrine	Yes	33(32.4%)	36(30.3%)	0.113	0.737
	No	69(67.6%)	83(69.7%)		
Household participate in cleaning latrine facilities	Yes	63(61.8%)	60(50.4%)	2.864	0.091
	No	39(38.2%)	59(49.6%)		
Who always cleans the latrine facility	Father	20(19.6%)	11(9.2%)	19.192	0.001
	Mother	13(12.7%)	22(18.5%)		
	Children	12(11.8%)	10(8.4%)		
	Others	24(23.5%)	11(9.2%)		
	Not applicable	33(32.4%)	65(54.6%)		
Are children faeces dispose-off in latrine	Yes	60(58.8%)	39(32.8%)	15.072	0.000*
	No	42(41.2%)	80(67.2%)		
Who is responsible disposing children's faeces	Father	11(10.8%)	9(7.65)	15.116	0.004*
	Mother	17(16.7%)	27(22.7%)		
	Children	13(12.7%)	4(3.4%)		
	Others	13(12.7%)	5(4.2%)		
	Not applicable	48(47.1%)	74(62.2%)		
using toilet is a primary prevention for diarrhoea	Yes	90(88.2%)	110(92.4%)	1.128	0.288
	No	12(11.8%)	9(7.6%)		
what motivates you to practice good sanitation	susceptibility to diarrheal diseases	52(51.0%)	58(48.7%)	2.095	0.553
	Severity of diarrheal diseases	20(19.6%)	29(24.4%)		
	Benefit of good sanitation	22(21.6%)	19(16.05)		
	Not applicable	8(7.8%)	13(10.9%)		
Total		102(100.0%)	119(100.0%)		

Source primary field data 2018 ** statistically significant at $P < 0.05$

According to the chi-square test result presented in table 6 above, adoptability to sanitation practices was expressed by; availability of sanitation facility ($X^2=22.458, p=0.000$), person responsible for persuasion ($X^2=30.056, p=0.000$), availability of household sanitation facility ($X^2=8.389, p=0.015$), methods of disposing human excreta ($X^2=23.552, p=0.000$). Who always

clean sanitation facility ($X^2=19.192$, $p=0.001$), disposal of children faeces ($X^2=15.072$, $p=0.000$), and the person responsible for the disposal ($X^2=15.116$, $p=0.004$).

Further findings from Key Informants

Are existing toilet/latrine facilities regularly kept clean?

The existing ones are kept clean.

Not of them clean but those do so, are 30% compared to 70% who not clean (KI, parish chief)

Who is responsible for keeping the latrine facilities clean?

The household members

There is an approach adopted called Follow Up Mandona calling community meetings to understand the challenges they face and giving immediate solutions to these challenges.

Its household members mostly women, though men also clean rarely

4.4 Undertakings to improve sanitation practices by communities in Nadunget

Table 7 Undertakings to improve sanitation practices by communities in Nadunget

Variables	Responses	Frequency n=221	Percentage (%)
Community makes bylaws	Yes	174	78.7
	No	47	21.3
Women and children involved in bylaw enforcement	Yes	174	78.7
	No	47	21.3
Community leader's follow-up latrine construction	Yes	179	81.0
	No	42	19.0
Who is responsible for sensitization	Village health team	177	80.1
	Community health workers	36	16.3
	Cultural leaders	4	1.8
	Missing	4	1.8
Are there committees for sanitation	Yes	158	71.5
	No	63	28.5
Committee ensures proper disposal of faeces	Yes	115	52.0
	No	43	19.5
	Not applicable	63	28.5
Aware of good sanitation promotion	Yes	175	79.2
	No	46	20.8
Ever participated in Sanitation activities	Yes	114	51.6
	No	107	48.4
Construction of latrines	No	194	87.8
	Yes	27	12.2
Construction of tipping tap	No	179	81.0
	Yes	42	19.0
Daily cleaning of latrines	No	205	92.8
	Yes	16	7.2
Fumigation of latrines	No	182	82.4
	Yes	39	17.6
VHT educate on sanitation	Yes	107	48.4
	No	114	51.6
	Total	221	100.0

Source primary field data 2018

The frequency distribution of undertaking factors indicates that the majority 174(78.7%) of the respondents agreed that they had by-laws to achieve open defecation free while 47(21.2%) disagreed. The majority 174(78.7%) of the respondents also agreed that women and children were involved in enforcing bylaws. The majority 179(81.0%) of them revealed that community leaders conduct follow up visits for sanitation facilities utilization. Sensitization was conducted by village health teams (80.1%) and cultural leaders (1.8%).

The majority 158(71.5%) of the respondents indicated that they had sanitation committees and a half 115(52.0%) of them reported that sanitation committees ensured proper disposal of faeces while 43(19.5%) disagreed. The majority 175(79.2%) of them revealed that they were aware about good sanitation promotion activities in their village. However, those who were aware, 114(51.6%) participated in those activities like construction of latrines 27(12.2%), 42(19.0%) tippy taps, 16(7.2%), fumigation 39(17.6%), daily cleaning of latrines 16(7.2%). Less than a half 107(48.4%) of the respondents agreed that village health teams educated them on diseases acquired from poor sanitation practices.

Bivariate analysis of undertakings and adoptability to sanitation practices among communities in Nadunget

Table 8 Bivariate analysis of undertakings and adoptability to sanitation practices among communities in Nadunget

Variables	Responses	Adoptability to sanitation practices		X ²	P-value
		Yes	No		
Community make by-laws	Yes	94(92.2%)	80(67.2%)	20.386	0.000*
	No	8(7.8%)	39(32.85)		
Women and children involved	Yes	93(91.2%)	81(68.1%)	17.517	0.000*
	No	9(8.8%)	38(31.9%)		
Community leaders follow	Yes	94(92.2%)	85(71.4%)	15.331	0.000*
	No	8(7.8%)	34(28.6%)		
Who responsible for sensitization	Village health team	85(83.3%)	92(77.3%)	4.44	0.218
	Community health workers	16(115.7%)	20(16.8%)		
	Cultural leaders	0(0.0%)	4(3.4%)		
	Missing	1(1.0%)	3(2.5%)		
Are there committees for sanitation	Yes	81(79.4%)	77(64.7%)	5.828	0.016
	No	21(20.6%)	42(35.3%)		
Committee ensures proper disposal of faeces	Yes	55(53.95)	60(50.45)	4.103	0.129
	No	24(23.5%)	19(16.0%)		
	Not applicable	23(22.5%)	40(33.6%)		
Awareness of good sanitation promotion	Yes	80(78.4%)	95(79.8%)	0.065	0.798
	No	22(21.6%)	24(20.2%)		
Ever participated in activities	Yes	47(46.1%)	67(56.3%)	2.299	0.129
	No	55(53.9%)	52(43.7%)		
Construction of latrines	No	85(83.3%)	109(91.6%)	3.497	0.061
	Yes	17(16.7%)	10(8.4%)		
Construction of tipping tap	No	72(70.6%)	107(89.95)	13.329	0.001*
	Yes	30(29.45)	12(10.1%)		
Daily cleaning of latrines	No	89(87.35)	116(97.55)	8.549	0.003*
	Yes	13(12.7%)	3(2.5%)		
Fumigation	No	77(75.5%)	105(88.2%)	6.139	0.013*
	Yes	25(24.5%)	14(11.8%)		
Others	No	100(98.0%)	112(94.1%)	2.162	0.141
	Yes	2(2.0%)	7(5.9%)		
VHTs educate us on disease of poor sanitation	Yes	44(43.1%)	63(52.9%)	2.114	0.146
	No	58(56.9%)	56(47.1%)		
Total		102(100.0%)	119(100.0%)		

*Source primary field data 2018 ** statistically significant at P<0.05*

The undertaking factors that showed adoptability of sanitation practices were; community by-laws ($X^2=20.386, p=0.000$), involvement of women and children in enforcement of bylaws ($X^2=17.517, p=0.000$), community leaders sanitation follow up visit ($X^2=15.331, p=0.000$), construction of tippy tap ($X^2=13.329, p=0.001$), daily cleaning of latrines ($X^2=8.549, p=0.003$) and fumigation of latrines and ($X^2=6.139, p=0.013$).

Further findings from Key Informants

Do norms/bylaws exist to enforce good sanitation practices in Nadunget sub-county?

There are by-laws formed by caritas 2016 and was not implemented, there is also sub-county by-laws, local government and the most important by-law respected by the community members is that is form at village level than sub-county level.

They have by-laws called sanitation but not yet enforced or implemented.

Yes, by-laws are in place for every household to have a latrine.

Hygiene and sanitation laws

Partners laws i.e. save the children and caritas.

Who has been responsible for creating awareness on the benefits of good sanitation in Nadunget sub-county?

Community members

Parish chief

Wash program at the sub-county

Community forum session

Community demonstration like how to construct a latrine, tip taps and proper hand washing.

Health extension workers like health assistants

What activities are in place in Nadunget sub-county to promote good sanitation practices?

Mobilization of local leaders to be exemplary.

Willingness of extension workers to do sensitization

Availability of village health teams

Raising community awareness in latrine usage

Training the village health teams on how to construct latrines

Construction of latrines by the community

Health education by health department

What other motivators are in place in Nadunget sub-county to promote latrine utilisation?

Using the existing projects benefits to those who have latrines.

Follow up to motivate people who have latrines

Do the villages have sanitation committees that enforce adoption of sanitation practices?

The sanitation committees are not there

The community have natural leaders that attached to the community and help follow up.

Community commitment to ensure that sanitation facilities are clean.

The sanitation committee help us make the community to learn and address their roles.

They are effective because they are really doing good job as most of them are exemplary and they all have latrines.

What should be put in place to ensure toilet/latrine construction and use is sustainable in Nadunget sub-county?

Close follow up with local government with people like LCI, health assistant and CDOs and villages health teams, sub-county chiefs

Use of behaviour change communication programs this helps to communicate change.

Having mixture of community programs.

4.5 Challenges met in promoting sanitation practices among communities in Nadunget

Table 9 Univariate analysis of challenges facing adoptability to sanitation practices

Variables	Responses	Frequency	Percentage (%)
Tools for construction accessible	Yes	70	31.7
	No	151	68.3
Pickaxe	yes	66	29.9
Spade	yes	87	39.4
Hoe	yes	59	26.7
Axe	yes	182	82.4
Have challenges in construction	Yes	141	63.8
	No	80	36.2
Limited materials	yes	24	10.9
Loose and collapse soils	yes	25	11.3
Hard and rocky soils	yes	14	6.3
High water table	yes	40	18.1
Others	yes	62	28.1
Cultural practices	Yes	7	3.2
	No	214	96.8
Sharing toilets with in-laws	Yes	4	1.8
Sharing toilet with men	Yes	2	.9
Pregnant women not allowed	Yes	3	1.4
Is Latrine facility shared	Yes	82	37.1
	No	139	62.9
Is there problem of sharing	Yes	60	27.1
	No	161	72.9
Why not share latrine	My latrine will get dirty	11	5.0
	My latrine fills up fast	48	21.7
	Others	3	1.4
	Not applicable	159	71.9
Enough space for construction	Yes	167	75.6
	No	54	24.4
	Total	221	100.0

Source primary field data 2018. Multiple responses factored in.

Table 9 presents challenges limiting adoptability to sanitation practices. The results indicated that only 70(31.7%) of the respondents had access to tools for construction of latrines. Multiple response report shows that 66(29.9%) had access to pickaxe, 87(39.4%) spade, 59(26.7%) hoe, and 182(82.4%) Axe. 141(63.8%) of the respondents had challenges in construction and 24(10.9%) reported limited materials, 25(11.3%) loose and collapse soil, 14(6.3%) hard and rocky soils, 40(28.1%) high water table and 7(28.1%) others.

Only 7(3.2%) of the respondents indicated that cultural practices affected their adoptability to sanitation practice. Multiple response results on challenges showed that 4(1.8%) had problems sharing toilets/latrines with in-laws, 2(0.9%) sharing latrines with men. It also

revealed 3(1.4%) pregnant women were not allowed to use latrines and 5(2.3%) women not allowed to use latrines.

More than a quarter 82(37.1%) of the respondents agreed that latrine facilities were shared while the majority 139(62.9%) of them disagreed. 60(27.1%) of the respondents indicated having a problem sharing their latrine facility with people outside household because it made the latrine dirty 11(5.0%), the latrine filled up fast 48(21.7%) and 3(1.4%) cited other problems. The majority 167(75.6%) of the respondents agreed that they had enough space for construction of new latrines.

Bivariate analysis of challenges met and adoptability to sanitation practices among communities in Nadunget

Table 10 Bivariate analysis of challenges and adoptability to sanitation practices among communities in Nadunget

Variables	Responses	Adoptability to sanitation practices		X ²	P-value
		Yes	No		
Tools for construction accessible	Yes	28(27.5%)	42(35.3%)	1.561	0.211
	No	74(72.5%)	77(64.7%)		
Pickaxe	No	72(70.6%)	83(69.7%)	0.019	0.892
	Yes	30(29.4%)	36(30.3%)		
spade	No	60(58.8%)	74(62.25)	0.26	0.61
	Yes	42(41.2%)	45(37.8%)		
Hoe	No	77(75.5%)	85(71.4%)	0.463	0.496
	Yes	25(24.5%)	34(28.6%)		
Axe	No	17(16.7%)	22(18.5%)	0.125	0.723
	Yes	85(83.3%)	97(81.5%)		
Challenges in construction	Yes	68(66.7%)	73(61.3%)	0.674	0.412
	No	34(33.3%)	46(38.7%)		
Limited access to materials	No	89(87.3%)	108(90.8%)	0.696	0.404
	Yes	13(12.7%)	11(9.2%)		
Loose and collapse soils	No	90(88.2%)	106(89.1%)	0.039	0.844
	Yes	12(11.8%)	13(10.9%)		
Hard and rocky soils	No	94(92.2%)	113(95.0%)	0.726	0.394
	Yes	8(7.8%)	6(5.0%)		
High water table	No	82(80.4%)	99(83.2%)	0.291	0.59
	Yes	20(19.6%)	20(16.8%)		
Others	No	70(68.6%)	89(74.8%)	1.033	0.309
	Yes	32(31.4%)	30(25.25)		
Cultural practices	Yes	6(5.9%)	1(0.8%)	4.552	0.033*
	No	96(94.15)	118(99.2%)		
Sharing toilets with in-laws	No	100(98.0%)	117(98.3%)	0.024	0.876
	Yes	2(2.0%)	2(1.7%)		
Sharing toilet with men	No	101(99.0%)	118(99.2%)	0.012	0.913
	Yes	1(1.0%)	1(0.8%)		
Pregnant not allowed	No	101(99.0%)	117(98.35)	0.201	0.654
	Yes	1(1.0%)	2(1.7%)		
Women not allowed	No	100(98.0%)	116(97.5%)	0.078	0.78
	yes	2(2.0%)	3(2.5%)		
Is Latrine facility shared	Yes	48(47.15)	34(28.6%)	8.044	0.005*
	No	54(52.9%)	85(71.4%)		
Problem of sharing	Yes	33(32.4%)	27(22.7%)	2.593	0.107
	No	69(67.6%)	92(77.3%)		
Why not share	Latrine will get dirty	4(3.9%)	7(5.9%)	3.957	0.266
	Latrine fills up fast	17(16.7%)	31(26.1%)		
	Others	1(1.0%)	2(1.7%)		
	Not applicable	80(78.4%)	79(66.4%)		
Have enough space	Yes	81(79.4%)	86(72.35)	1.518	0.218
	No	21(20.6%)	33(27.7%)		
Total		102(100.0%)	119(100.0%)		

Source primary data 2018 *** statistically significant at P<0.05

According to the result presented in table 10 above, cultural practices ($X^2=4.552$, $p=0.033$) and sharing the latrine facility ($X^2=8.044$, $p=0.005$) influenced adoptability to sanitation practices.

Further findings from Key Informants

What limits access to toilet/latrine facilities in the villages in Nadunget sub-county?

The attitude of the community towards latrine construction and its use.

Lack of resources to enable them construct latrines

Lack of materials like logs are very hard to get that makes it difficult for village to get logs for construction of latrines.

Lack of ability to use a toilet and negative attitude towards using latrines.

Cultural beliefs, and poverty where one cannot go for casual labour to earn a living and latrine construction.

We have problem with grass because since the children started the program in June when grasses have not yet grown that made fail to construct toilet.

What problems do village members face in utilizing toilet/latrine facilities?

The mind-set is not positive towards latrine usage and they prefer open defecation (bush).

Lack of pole and people feel they will fall inside.

Scarcity of materials for roofing and the wall

What limitations exist to enforcement of these norms/bylaws in Nadunget sub-county?

Inadequate resource

The key players are still planning on how to fully support or implement the laws.

Inadequate sensitization and enforcement.

Lack of funding to help extension workers to go for sensitization

What have been the challenges in mobilizing village members in Nadunget sub-county to utilize latrine facilities?

Conflicting community events like market, hunger, some organization like world health organization brings food that makes difficult to get community members.

Fund to mobilize community

Poor communication

Poor response by the community

What are some of the shortcomings for the sanitation committees in Nadunget sub-county?

They are not very active

Some community demand for handouts like giving something like money which save the children does not give but just to help them construct.

4.6 Multivariate analysis of factors determining adoption to sanitation practices

In order to identify jointly combined factors that determine the adoptability to sanitation practices among community in Nadunget sub-county, Moroto district, a binary logistic regression model was fitted. Binary regression model was used because the dependent variable (adoptability to sanitation practices) is dichotomous coded as 1- adoption and 2-non-adoption. The dependent variable was regressed with categorical independent variables that were statistically associated at bivariate analysis (chi-square) at 95% level of confidence. However, the significant independent variables included among the demographics of respondents: age, religion, occupation and monthly household income. Responsiveness factors; availability of sanitation facility for human excreta disposal, persuasion to own latrines, alternative way of disposing human excreta, disposal of children faeces in latrines and who is responsible for disposing it. Undertaking factors include; community by-laws, involvement of women and children, community leaders follow up visit for sanitation facilities, construction of tipping taps, daily cleaning of pit latrines and fumigation of pit latrines. The level of significance is presented using odds ratio with corresponding confidence interval and probability value (p-value).

Table 11 Multivariate analysis of factors determining adoption to sanitation practices

Variables	P-value	Crude odds ratio	P-value	Adjusted odds ratio at 95%CI
Demographic characteristics				
Age	0.003			
18-25 years		Reference	1	
26-35 years	0.003	0.135(0.036-0.506)	0.008	0.241(0.084-0.69)
36-45 years	0.004	0.018(0.001-0.269)	0.039	0.103(0.021-0.89)
46-55 years	0.287	0.587(0.22-1.565)	0.962	1.02(0.458-2.27)
56-65 years	0.257	0.487(0.14-1.692)	0.81	0.883(0.32-2.436)
Religion	0.519			
Muslims	0.089	3.825(0.815-17.952)	0.64	3.608(0.93-14.003)
Born again	1	Reference		
Occupation	0.001			
Peasant farmer	0.038	3.948(1.077-14.469)	0.555	1.343(0.5054-3.569)
Business	0.001	9.150(2.504-33.439)	0.001	4.296(1.779-10.377)
Government employee		Reference		1
Monthly income	0.034			
<50,000	0.171	Reference		1
50,000-100,000	0.076	0.338(0.102-1.118)	0.17	0.457(1.49-1.399)
151,000-200,000	0.020	7.254(1.375-38.253)	0.006	8.232(1.848-36.673)
Responsiveness				
Sanitation facility for disposal human excreta				
Yes	0.000	3.761(2.152-6.571)	0.000	3.671(2.152-6.571)
No		Reference		
Persuaded you to own latrine	0.002			
Cultural leader		Reference		1
Neighbour	0.836	0.879(0.259-2.982)	0.445	0.636(0.2-2.028)
LCI	0.105	0.154(0.016-1.477)	0.105	0.159(0.017-1.47)
Schools	0.382	1.788(4.486-6.576)	0.9	0.926(0.277-3.09)
NGOS	0.005	3.868(1.51-9.911)	0.017	2.945(1.217-7.127)
How you dispose human excreta	0.012			
Cat method	0.001	17.043(3.072-94.544)	0.001	12.897(2.688-61.87)
Bush	0.009	43.066(2.523-734.98)	0.038	11(1.137-106.43)
Others		Reference		1
Undertakings by community				
Community make by-laws				
Yes	0.000	5.000(2.184-11.446)	0.000	5.728(2.53-12.967)
No		Reference		1
Construction of tippy tap				
Yes	0.004	0.325(0.153-0.692)	0.000	0.269(0.129-0.56)
No		Reference		1
Fumigation of latrines				
Yes	0.028	0.427(0.2-0.913)	0.015	0.411(0.2-0.841)
No		Reference		1
Is latrine facility share				
Yes	0.005	2.222(1.274-3.876)	0.005	2.222(1.274-3.876)
No		Reference		1

Crude Odds Ratio (cOR), Confidence Interval (CI) and Adjusted Odds Ratio (aOR)

According to multivariate analysis presented in table 11 above, adoption to sanitation practices was observed in respondents who were business persons compared to those government employees (aOR=4.296;95%CI:1.779-10.377,p-0.001). The study finding also established that respondents whose monthly income was about 151,000 to 200,000 shillings

were most likely to adopt sanitation practices compared those whose monthly income was less than 50,000 shillings (aOR=8.232;95%CI:1.848-36.673,p-0.006).

There were higher chances of adopting to sanitation practices among respondents who agreed that they had sanitation facility for disposal of human excreta unlike those who did not have (aOR=3.761; 95%CI: 2.152-6.571, p-0.000). In addition, participants who were persuaded by NGOs to have their own latrine were 2 times more likely to adopt sanitation practices compared to those who were persuaded by village chairpersons (aOR=2.945;95%CI:1.217-7.127,p-0.017).

However, respondents who indicated that they did not have a sanitation facility for disposal of human excreta were 12 times most likely to use cat method to dispose their faeces instead of adopting to sanitation practices (aOR=12.897;95%CI:2.688-61.87,p-0.001). In the undertaking factors, the study established that participants in villages where by-laws to achieve open free defecation status existed were 5 times more vlikely to adopt sanitation practices over their other counterparts (aOR=5.728;95%CI:2.53-12.967,p-0.000). Higher odds of adopting sanitation practices was seen among respondents who revealed that latrine facilities were shared (aOR=2.222; 95%CI: 1.274-3.876, p-0.005).

CHAPTER FIVE: DISCUSSION OF RESULTS

5.0 Introduction

This chapter presents discussion of findings in relation to the different views of the other scholars in accordance with objectives of the study.

5.1 Proportion of households adopting to sanitation practices

The proportion of households adopting to sanitation practices in Nadunget was 46.15%; this means 53.85% still practiced poor sanitation defecating in the open, using the cat method or other discouraged methods for faecal disposal. It indicates low adoptability to sanitation practices, and yet poor sanitation practices increase the risk to diarrhoeal & neglected tropical diseases such as trachoma; and stunting that affect mostly the under-five children. In Ethiopia, Oljira and Berkessa (2016) revealed 88.2% of the households as having latrines; almost doubling the adoptability to sanitation practices in Nadunget sub-county. The contrast could be because of the goals set by the Ethiopian government that stressed more on latrine coverage than use. Oljira and Berkessa (2016) reveals that only 62% of the latrines were functional. In Uganda the sanitation drive emphasises both coverage and use of sanitation facilities. Important to note is the fact that as 80% of countries recognized right to water, just about 50% recognized right to sanitation (WHO, 2012a). Until 2010, the United Nations (UN) had not recognized access to sanitation as a basic human right (WHO, 2012b). Despite the intensive advocacy and lobby initiatives to raise the sanitation profile globally, the sanitation sector remains underfunded and is a key challenge in most developing countries (WSP, 2012)

The sustainable development goal target for sanitation sets to achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations by 2030. Uganda set a target of 79% latrine coverage by 2020. The low access to sanitation of 46.15% in Nadunget also covers the latrines shared implying latrine coverage could even be lower. There is therefore need for concerted efforts to enhance access and therefore adoptability to sanitation practices among communities in Nadunget sub-county. Oljira, Berkessa (2016) noted that “Ethiopia achieved the largest decrease in the proportion of the population practicing open defecation, from 44.3 million Ethiopians in 1990 to 28.3 million in 2015, or an average reduction of over

4 percentage points per year over 25 years; and yet 97.2% still lacked access to improved sanitation.

The low adoptability to sanitation practices of just 46.15% implies a larger proportion in Nadunget still practiced poor sanitation and thus increased risk by communities to high morbidity rates, increased incidences of stunting in children, decreased mental and social well-being and also increased morbidity rates that result from poor sanitation.

5.2 The degree of responsiveness by communities to sanitation practices.

The study findings identified availability of sanitation facility, person responsible for persuasion, methods of disposing human excreta, person always responsible for cleaning sanitation facility, disposal of children faeces as those showing responsiveness.

The study findings established that respondents whose monthly income was about 151,000 to 200,000 shillings were most likely to adopt sanitation practices compared those whose monthly earnings were less than 50,000 shillings. This is consistent with a study done in Hulet Ejju Enessie district of Ethiopia that showed Households with very high yearly income being 9.90 times more likely to use latrines than their counterparts with low incomes. Pattanayak et al. (2009) in conformity found out in a study that having a latrine was 1.5 times higher with households that had a higher income and was the same for a study conducted in North Gondar, Ethiopia in 1999. Getachew (2010) in agreement also noted that wealthier and better educated upper class families that had prior exposure to latrines seemed to express gratitude for the ease and convenience provided for by the existence of latrine facilities. The possible reason could be that high-income households would also be interested in enjoying the dignity and a high status in the community that comes with owning a latrine facility. Also, availability of funds could mean that the household could afford to pay for construction of their own latrine facility. Programs that stimulate household income generating activities would complement sanitation programs in a bid to enhance adoptability to sanitation practices in Nadunget sub-county. Important to note is a study conducted in rural Mali by Pattanayak et al. (2009) that provided clear evidence that behavioural interventions with no monetary subsidies substantially increased utilization of latrines. Many at times it is due to the income situation in communities, there may be temptations to design sanitation programs that offer monetary subsidies.

The low income among the communities in Nadunget sub-county implies households have limited capacity to avail material, tools and labour for latrine construction and so resulting in low adoptability to sanitation practices.

The study findings also revealed that respondents who were persuaded by NGOs to have their own latrine were 2 times more likely to adopt sanitation practices compared to those who were persuaded by Village Chairpersons. It could be possible that community members do not heed to sanitation messages from their village chairpersons probably because they are not informed and also are not leading an exemplary life in terms of sanitation. Hammer (2013), noted that latrine construction must be complemented with educational efforts and hygiene promotion specifically prior to latrine construction efforts as it ascertains latrine use and sustainability of structures. In Woreda, South Ethiopia, Menfistie and Baraki (2010) noted that communities restricted latrine utilization to times of health professionals' visits. Lunn (2000) stresses out that community mobilization for latrine construction and use must focus on sanitation and hygiene behaviour change as opposed to conventional approaches that provide households with subsidies for infrastructure. Mobilizing communities ensures a collective decision-making process that encourages use of locally available material rather than relying on external support. From this study's finding, it could be possible that NGOs ensure a longer contact time with the communities thereby impacting positively on behaviour change towards latrine construction.

Respondents who indicated not having a sanitation facility for disposal of human excreta were 12 times most likely to use cat method dispose their human waste instead of adopting to sanitation practices. Lunn (2000) in his study in Keneba, Gambia indicated that people were more likely to use latrines if they were better constructed and maintained and also noted that building latrines enhanced social status. A study in Luwero by Kaddu (2016) found out that men who defecated in the open stated that latrine use did not suite their daily routines. This conforms with the WHO (2014), that indicated 5 million people in Uganda still practiced open defecation. The cat method does not safely exclude faeces from human contact given Nadunget sub-county is a livestock keeping community. There is therefore, need to ensure access to basic sanitation for all in Nadunget sub-county.

5.3 Undertakings by communities to improve sanitation practices.

The undertakings that significantly associated with adoptability of sanitation practices included; existence of community by-laws, involvement of women and children in enforcement of by-laws, community leader's follow up visits on sanitation, construction of tippy taps, daily cleaning of latrines and fumigation of latrines.

The study established that participants in villages where by-laws existed to an achieve open defecation free status were 5 times most likely to adopt sanitation practices unlike their other counterparts. This is consistent with the study in Benin by Jenkins (1999) where cultural norms influenced households to ensure latrines were kept clean after defecation and in India were water was put in latrines to ensure safe disposal of children's faeces. However, it does not conform to O'Connell's (2014) findings from a global review that noted that cultural norms considered defecating in the latrine a 'sin' and thus served as a deterrent to adoption of good sanitation practices. Cairncross et al. (2010) acknowledges bylaws to be able to play an immense role in sanitation promotions as they ensure sanitation facilities are constructed where new houses are to be constructed and thereby increase access to latrine facilities. In Aburi community in Ghana, Owusu and Adjibolosoo (2016) noted in disagreement that even with enforcement of sanitation by-laws by the district assembly, it was not deterrent enough to positively change behaviour of the community members because of their attitudes. Harpe (2009) observes that an enabling environment provided for by existent by-laws ensure effective delivery of water, sanitation and hygiene programs. The study finding implies for communities to adopt sanitation practices, an enabling environment provided for by by-laws need to be developed by communities. According to observations in Nadunget views of opinion leaders are highly considered by their followers. Once targeted, opinion leaders can be useful in developing cultural norms and by-laws that will propel sanitation adaption to greater heights; as Hammer (2013) agrees that considering cultural beliefs and norms has long held true for changing sanitation around the globe.

5.4 Challenges faced by communities in promoting sanitation practices.

Challenges limiting adoptability to sanitation practices in Nadunget included; access to tools for construction of latrines, limited materials, loose and collapse soil, 14(6.3%) hard and rocky soils and high-water table.

Adoption to sanitation practices was less seen among respondents who revealed that latrine facilities were shared. In agreement to this was a study in Ghana, where the average number of users of shared latrines tripled that of household latrines; however, it presented a

likelihood of unhygienic conditions for the latrines, even though sharing reduced maintenance costs and ensured shared cleaning responsibility. In Tanzania, a study revealed sharing latrines was common and that shared latrines provided as much protection compared with private latrines and there was no risk of contracting trachoma. This allays the fears above of sharing latrines a risk factor to disease spread. The study finding implies that when latrines are shared, even amidst of other challenges, many more households practice good sanitation. It is also good to note that most of Nadunget sub-county sits on black cotton soil with high adhesive properties, with rains, the constructed latrines collapse or get filled up with water which provides a serious deterrent to latrine construction and use. Given the conditions in Nadunget, an approach that encourages sharing of latrines at start and later progresses to privately owned latrines at household level would ensure enhanced adoption of sanitation practices. In my opinion, promotion of appropriate approaches and technology options must be emphasized in such a tough geology in Nadunget sub-county to minimize household fatigue in constructing and reconstructing latrines that exist sustainably.

CHAPTER SIX: CONCLUSION AND RECOMMENDATIONS

6.0 Introduction

This chapter presents conclusions drawn and several recommendations suggested based on the study findings.

6.1 Conclusions

6.1.1 Proportion of households adopting to sanitation practices

Less than a half 102(46.15%) of the households accessed sanitation facilities; meaning 119 (53.85%) still practiced poor sanitation and thus low adoptability to sanitation practices and thereby putting the whole population at risk to diarrhoeal diseases outbreak.

6.1.2 The degree of responsiveness by communities to sanitation practices

- i. Households that were found to have a significant association with adoptability to sanitation practices were those that who had employment
- ii. Those that hand a monthly income ranging from 151,000-200,000 Uganda shillings were most likely to adopt sanitation practices compared to those whose monthly earnings were less than 50,000 Uganda shillings.
- iii. Respondents that were persuaded by NGOs were 2 times more likely to adopt sanitation practices as compared to those who were persuaded by their Village Chairpersons.
- iv. Having a sanitation facility increased the households' likelihood of adopting to sanitation practices 12 times more than those without.

6.1.3 Undertakings by communities to improve sanitation practices.

- i. Undertakings that influenced adoption of sanitation practices included; existent bylaws, involvement of women and children in enforcement of the bylaws, community leaders who monitor sanitation promotion available, tippy tap construction, daily cleaning and fumigation of the sanitation facilities.
- ii. Households in villages where by-laws existed were 5 times more likely to adopt sanitation practices as compared to those in villages without.

6.1.4 Challenges faced by communities in promoting sanitation practices.

- i. Challenges faced in adoption of sanitation practices included; lack of tools, limited construction materials, loose and collapsible soils, hard and rocky soils and high-water table.
- ii. Households that shared sanitation facilities exhibited higher degree of adopting sanitation practices as compared to those that did not.

6.2 Recommendations

6.1.1 Proportion of households adopting to sanitation practices

- i. A multisectoral approach to sanitation is called for to ensure an expeditious enhancement of sanitation practices in Nadunget sub-county.

6.1.2 The degree of responsiveness by communities to sanitation practices

- i. There is need to design sanitation programs to run alongside those that stimulate household income as complementary programs.
- ii. Consorted efforts should be put in place to ensure local governments and CSOs operate in a district wide approach to ensure a common voice to sanitation promotion.

6.1.3 Undertakings by communities to improve sanitation practices.

- i. The district should develop an ordinance popularized form the Public Health Act which will then be escalated at respective lower local governments in form of bylaws.

6.1.4 Challenges faced by communities in promoting sanitation practices.

- i. Promotion of appropriate approaches and technology options must be emphasized in such a tough geology in Nadunget sub-county to minimize household fatigue in constructing and reconstructing latrines that exist sustainably.
- ii. Design a sanitation approach that encourages sharing of latrines at start and later progresses to privately owned latrines at household level.
- iii. Further research should be carried out to address any gaps that the current study may not have addressed.

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APPENDICES

APPENDIX 1: CONSENT FORM

Dear sir/madam, my name is Daniel Emadu a student of Clarke International University – Uganda, conducting study; entitled “ASSESSMENT OF ADOPTABILITY TO SANITATION PRACTICES AMONG COMMUNITIES IN NADUNGET SUB-COUNTY, MOROTO DISTRICT –UGANDA”.

The aim of this study is to assess adaptability to safe sanitation practices among communities in Nadunget sub-county, Moroto district – Uganda.

You are under no obligation to participate in this study, participation is voluntary, and you are free to withdraw consent to participate at any time without prejudice. Feel free to ask any questions before, during or after the interview. There is no payment attached. Confidential nature of this study will be maintained throughout the study period till the finalization of the report, to which you have the right to know the interview results.

The possible expected benefits of this study will include; providing baseline information to be used by decision makers in Uganda and specifically the districts in Karamoja to develop appropriate strategies to enhance adoptability to safe sanitation practices thereby reducing the risk to diseases associated to unsafe sanitation practices.

There is **No** risks that will be posed to you as a result of taking part in this study.

I have been asked to participate in the study to assess adoptability to sanitation practices in Nadunget sub-county, Moroto District-Uganda. I have read the above and understood the purpose of this study, its nature and procedures and all my questions have been answered to my satisfaction. Therefore, I do agree to participate freely in this study.

Signature of respondent: -----Date: -----

Signature of researcher: ----- Date: -----

APPENDIX II: QUESTIONNAIRE (ENGLISH)

Instructions: please tick the most appropriate answer and where necessary fill in the answer in the space provided.

QN	Description	Responses	Skip
Section A: CHARACTERISTICS OF RESPONDENTS			
1	What is your age?	----- full years	
2	What is your sex	Male.....[1] Female.....[2]	
3	What is your religion?	Muslims..... . [1] Catholics..... ... [2] Protestants..... [3] Born again..... [4] Others (Specify).....[5]	
4	What is your level of education?	None.....[1] Primary.....[2] Secondary.....[3] Tertiary/ University.....[4]	
5	What is your occupation	Peasant farmer.....[1] Business.....[2] Housewife.....[3] Self-employed.....[4] Government employee.....[5]	
6	Monthly household income	1-50,000.....[1] 50,000-100,000.....[2] 101,000-150,000.....[3] 151,000-200,000.....[4] >200,000.....[5] Don't earn.....[6]	

DEPENDENT VARIABLES ADOPTION TO SANITATION PRACTICES			
7	Do all members of your village access a toilet/latrine?	Yes[1] No[2]	
8	If yes, specify where you access a toilet/latrine from.	My own.....[1] Neighbours.....[2] Nearby institution.....[3] Public latrine.....[4] Others (specify).....[5]	
9	Using a toilet/latrine is better than using the bush for defecating	Yes[1] No[2]	
10	Do you have tippy-tap at your household latrines?	Yes[1] No[2]	
11	Do you have soap/ash for washing hands after visiting toilets?	Yes[1] No.....[2]	
12	Is your village declared open defecation free?	Yes[1] No[2]	
SECTION B: RESPONSIVENESS			
13	Do you have sanitation facility for disposal of human excreta?	Yes.....[1] No.....[2]	
14	If yes, which sanitation facilities do you have in your household?	Dug holes.....[1] Pit latrine.....[2] Ventilated improved pit	

		latrine.....[3] Others (specify)[4]	
15	If no, how do you dispose-off human excreta in your household?	Cat method[1] Bush.....[2] Others[3]	
16	Do you have a hand washing facility always available at the toilet/latrine?	Yes[1] No[2]	
17	Do you have clean water source available for domestic use?	Yes[1] No[2]	
18	If no, where do you get water from?	Big streams.....[1] Dug pits.....[2] Spring wells.....[3]	
19	Do your household members participate in cleaning sanitation facilities	Yes[1] No.....[2]	
20	If yes, who always makes sure that your toilet/latrine is clean?	Father.....[1] Mother[2] Children.....[3] Others (specify).....[4]	
21	Are children's faeces disposed-off in the latrine	Yes.....[1] No.....[2]	

22	Who is responsible for disposing-off children's faeces?	Father.....[1] Mother..... [2] Children.....[3] Others (specify).....[4]	
23	Using of toilets is a primary prevention of diarrheal disease	Strongly Agree.....[1] Strongly Disagree.....[2]	
24	Who would would best persuade you to construct and use a latrine	Cultural leader.....[1] Neighbour.....[2] LCI.....[3] VHT.....[4] SCO.....[5] District.....[6] Others (specify)[7]	
25	What motivates you to have a good sanitation facility?	Susceptibility to diarrhoeal diseases[1] Severity of diarrhoeal disease.....[2] Benefit of good sanitation.....[3]	
SECTION C: UNDERTAKINGS			
26	Did the community make by-laws to achieve open free defecation status?	Yes..... ...[1] No.....[2]	
27	Are women and children involved in implementing by laws?	Yes..... ...[1] No.....[2]	
28	Do you have Community leaders who conduct follow up visits for sanitation facilities?	Yes[1] No.....[2]	
29	Who is responsible for sensitizing village members in toilet/latrine use?	Village health teams.....[1] Community health workers..... . [2] Cultural leaders.....[3]	

30	Is there a committee for sanitation in your village?	Yes.....[1] No..... [2] Not sure..... [3]	If no skip to Qn21
31	Does the committee ensure that you properly dispose-off faeces?	Yes..... ...[1] No.....[2]	
32	Are you aware of any good sanitation promotion activities in your village?	Yes...[1] No[2]	
33	Have you ever participated in any of the activities?	Yes[1] No[2]	
34	If yes which activities have participated	Construction of pit latrines.....[1] Construction of tippy taps.....[2] Daily cleaning of pit latrines.....[3] Fumigation of pit latrines with smoke.....[4] Others (specify).....[5]	
35	Village health teams educate us on the diseases acquired from poor sanitation practices	Yes.....[1] No.....[2] Not sure.....[3]	
SECTION D: CHALLENGES			
36	Tools for construction of latrines are near and can easily be accessed	Yes.....[1] No.....[2]	

37	If yes, which materials are available?	Pickaxe[1][1] Spade.....[2] Hoe.....[3] Axe[4]	
38	Do you have challenges in construction or excavation of pit latrines?	Yes.....[1] No[2]	
39	If yes which challenges are those?	Limited access to materials.....[1] Loose and collapsible soils.....[2] Hard and rocky soils.....[3] High water table.....[4] Others (specify).....[5]	
40	Do you have any cultural practices that do not support use of latrines?	Yes[1] No[2]	
41	If yes which cultural practices	Sharing toilets with in-laws.....[1] Sharing toilet with men.....[2] Pregnant not allowed to use latrines.....[3] Women not allowed to use latrines.....[4]	
42	Is your toilet/latrine facility shared?	Yes.....[1] No.....[2]	
43	Do you have a problem sharing with people outside your household?	Yes...[1] No.....[2]	
44	Why would you not share a toilet/latrine?	My latrine will get dirty.....[1]	

		My latrine will get filled up fast.....[2] Others (specify)[3]	
45	Do you have enough space for construction of a new toilet/latrine	Yes.....[1] No.....[2]	

APENDIX III: TRANSLATED QUESTIONNAIRE (NGAKARIMOJONG)

QN	Description	Responses	Skip
Section A: Eyakaunitene Angulingithio			
1	Ngikon kar ngiai?	----- Ngikaru	
2	Irai iyong aberu kori ekile?	Ekile.....[1] Aberu.....[2]	
3	Ngai ekon edin?	Ngithilam.....[1] Ngikatulikai[2] Semus..... [3] Mulokole..... [4] Nguluce (Tolimu).[5]	
4	Ithiomit iyong toni ai?	Emamu.....[1] P”rimari ai.....[2] Secondary.....[3] Ekothi/Louniversity.....[4]	
5	Inyo ekon tic?	Eketan.....[1] Emucurutu.....[2] Aberu ekekal.....[3] Eketic kon bon.....[4] Eketiyan ka apukan...[5]	
6	Ngithilinga ngiya akon ekal toriamu kor kitiyau angololap?	1-50,000.....[1] 50,000-100,000.....[2] 101,000-150,000.....[3] 151,000-200,000.....[4] >200,000.....[5] Ngin ngenyami ithilinga angololap.....[6]	

DEPENDENT VARIABLES ADOPTION TO SANITATION PRACTICES			
7	Ithitiyaete mono ngitunga alore daddang ngicoronina?	Ee robo[1] Emamu...[2]	
8	Akithitia ecoron iloin akibobon namoni	Ee robo[1] Emamu...[2]	
9	Iyakar iyong ijirikan ngolo kilothet ngakan kirikakin abongun alocoroo?	Ee robo[1] Emamu...[2]	
10	Iyakar ethi ethabunyi kori ekuron loilothere akan kirikakin alomar locoron?	Ee robo[1] Emamu...[2]	
11	Acamut ngitunga ka ekuthire ajongore akibobon caricaria?	Ee robo[1] Emamu...[2]	
SECTION B: ACAMUNET			
12	Iyakatar iyo ecoronia?	Ee robo[1] Emamu..[2]	
13	Ee keyai, alikabila kecoron?	Akipany naedukunitoi.....[1] Ecoron ngolo kebokunitai.....[2] Ecoron ngolo eya ngidirithai.....[3] Nguluce (Tolimu)[4]	
14	Ee kemamu, alipite bo ibukonere ngacin, elemanere alokal kuth?	Abokar kakinuk[1] Amoni.....[2] Ngunuce (Tolimu).....[3]	

15	Eyakare iyeth neni ilothere ngakan juijui alocoronia?	Ee robo[1] Emamu..[2]	
16	Iyakar iyong neni wokite ngakipi nguna athegak?	Ee robo[1] Emamu..[2]	
17	Ee kemamu, aibo iwoki iyon?	Nangolo.....[1] Nakuja.....[2] Elelia.....[3]	
18	Itetheget mono ngitunga alokal kon neni kathegith?	Ee robo[1] Emamu..[2]	
19	Ee kitetheget, ngai mono etemokino akitetheg ecoron?	Papa.....[1] Toto[2] Ikoku.....[3] Nguluce (Tolimu).....[4]	
20	Ebukonokinio iyes ngacin angidwe ocoronia?	Ee robo[1] Emamu...[2]	
21	Ngai ebukonori ngacin angidwe alocoron?	Papa.....[1] Toto..... [2] Ngide.....[3] Nguluce (Tolimu).....[4]	
22	Akithitiya ecoron erai ageunet ngina itogongoi ngidekethio ka akiwurut	Ecamuna nooi.....[1] Emamu ecamuna nooi.....[2]	
23	Iyo ikinit iyong ekibure ayakaunor	Ayakaun ekiuruton.....[1]	

	ngiboro ngulu kathegith?	Alalu angidekesio ke kiuruton.....[2] Ajokith ka athegith.....[3]	
SECTION C: ALOTHIKINET			
24	Etubunito ngitunga ngikithila ngulu elemarere akibobon caricari?	Ee robo[1] Emamu..[2]	
25	Eya ngaberu ka ngidwe atubun akithitiya ngikithila mgulua?	Ee robo[1] Emamu..[2]	
26	Eya ngikarikok ngulu kere ngulu etupito ngiticithio ka athegith a?	Ee robo[1] Emamu..[2]	
27	Ngai epolokinit akitatam ngitunga akithitiya ngicoroni aloreria?	Ngidakitarin lukere.....[1] Ngiketiya ngulu kathegith.....[2] Ngikathikou nginikatikok kere.....[3]	
28	Eya ngikarikok ngulu epolokinito athegith alore a?	Ee robo[1] Emamu..[2] Ngau.....[3]	If no skip to Qn30
29	Epedorit ekomit kathegith akiteyenun alemari ngacim alore?	Ee robo[1] Emamu...[2]	
30	Iyeni iyong ngiticithio ngulu itopolorito athegith alore a?	Ee robo[1] Emamu...[2]	

31	Itiyator mono iyong edio a?	Ee robo[1] Emamu...[2]	
32	Ee, ali ibu iyong kitiya?	Akibok kakiduk ngicoronin.....[1] Akiwaanakin ngijerikanin lulotheregakan[2] Apyeere ngicoronin anginikware.[3] Akipurionokin ngicoronin.....[4] Ngunuce (Tolimu).....[5]	
33	Itatamete ngidakitarin lukere ngitunga ngidekethio ngulerukario emam athegith alore?	Ee robo[1] Emamu..[2] Ngau.....[3]	
SECTION D: ATIKITHIO			
34	Ngiboro luesubere ngicoronin apatana ariamun	Ee robo.....[1] Emamu.....[2]	
35	Anikeyakathi, aluboro eyakathi?	Ethurur[1] Akitiyo.....[2] Emeleku.....[3] Aep[4]	
36	Iyakar iyong ationith akiduk kori akikbok ecoron a?	Ee robo[1] Emamu..[2]	
37	Ani keyai, anitionith iriamunit iyong?	Engopito ngiboro ludukete.....[1]	

		Erai ngaluk epan atiyankin.....[2] Ngalup ngunagagon ka ngatabath.[3] Ecowa.....[4] Nguluce (Tolimu).....[5]	
38	Eya ngitalio itengirot akithitiya ecoron a?	Ee robo[1] Emamu...[2]	
39	Ee keya, alutalio?	Akimor ecoron kangikamurak.....[1] Akimor ecoron ka ngikiliok.....[2] Ngecamakitai ngaberu ngu epotiyete[3] Ngecamakinitai ngaber.....[4]	
40	Emorio ecoron kon a?	Ee robo[1] Emamu..[2]	
41	Iyakatar iyong ationith akimor ecoron ka ngitunga alokinga ekon kale?	Ee robo[1] Emamu..[2]	
42	Nyo ngimoriata iyong ecoron ka ngitunga ice?	Engorianar ekacoron.....[1] Ilelebun ekacoron atipet..... ...[2] Nguluce (Tolimu)[3]	
43	Iyakatar iyong ngalup neni idukoni ecoron ngolo kitete?	Ee robo[1] Emamu.....[2]	

APPENDIX IV: KEY INFORMANT GUIDE

1. a) Do all village members have access to toilets/latrines facilities in Nadunget sub-county?
b) What limits access to toilet/latrine facilities in the villages in Nadunget sub-county?
c) Are existing toilet/latrine facilities regularly kept clean?
d) Who is responsible for keeping the latrine facilities clean?
e) What problems do village members face in utilizing toilet/latrine facilities?
2. a) Do norms/bylaws exist to enforce good sanitation practices in Nadunget sub-county?
b) If yes, which norms/bylaws are in place to promote sanitation in Nadunget sub-county?
c) Are norms/bylaws enforced to ensure good sanitation in Nadunget sub-county?
d) What limitations exist to enforcement of these norms/bylaws in Nadunget sub-county?
3. a) Have the village members in Nadunget sub-county been made aware of the benefits of good sanitation?
b) If yes, who has been responsible for creating awareness on the benefits of good sanitation in Nadunget sub-county?
c) Have the village members embraced using toilet/latrine facilities in Nadunget sub-county?
d) What activities are in place in Nadunget sub-county to promote good sanitation practices?
e) What other motivators are in place in Nadunget sub-county to promote latrine utilisation?
f) What have been the challenges in mobilizing village members in Nadunget sub-county to utilize latrine facilities?
4. a) Do the villages have sanitation committees that enforce adoption of sanitation practices?
b) Do you see any benefit of having sanitation committees?
c) What are some of the shortcomings for the sanitation committees in Nadunget sub-county?
5. What should be put in place to ensure toilet/latrine construction and use is sustainable in Nadunget sub-county?

Thank you

APPENDIX V: INTRODUCTORY /CORRESPONDENCE LETTER



making a difference to health care

Dean's Office-Institute of Public Health and Management

Kampala, 06th November 2018

To

.....
.....
.....

Dear Sir/Madam,

RE: ASSISTANCE FOR RESEARCH

Greetings from International Health Sciences University.

This is to introduce to you **Daniel Emađu Reg. No. 2016-MPH-RL FEB-021** who is a student of our University. As part of the requirements for the award of a Masters Degree of Public Health, the student is required to carry out field research for the submission of a Research Dissertation

Daniel would like to carry out research on issues related to: **Assessment of Adoptability to Sanitation Practices among Communities in Nadunget Sub-County, Moroto District-Uganda**

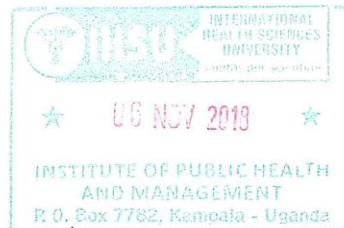
I therefore request you to render the student such assistance as may be necessary for the research.

I, and indeed the entire University are thanking you in anticipation for the assistance you will render to the student.

Sincerely Yours,

Alege John Bosco

Dean, Institute of Public Health & Management



The International Health Sciences University
P.O. Box 7782 Kampala – Uganda
(+256) 0312 307400 email: deaniphm@ihsu.ac.ug
web: www.ihsu.ac.ug

APPENDIX VI: REQUEST FOR PERMISSION FROM MOROTO DLG

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C/o International Health Sciences University

P.O. Box 7782

KAMPALA

12/11/2018



The
Chief Administrative Officer
Moroto District Local Government.

Dear Sir,

RE: REQUEST FOR PERMISSION TO CONDUCT RESEARCH IN NADUNGET SUB-COUNTY

I humbly submit my request to assess adoptability to good sanitation practices in Nadunget sub-county-Moroto District.

I am the Public Health Specialist for Technical Support Unit 9 Moroto for the Ministry of Water and Environment, but also a student pursuing a master's in public health from International Health Sciences University-Kampala. I intend to conduct the above research in partial fulfilment of the requirements for the award of the master's degree already mentioned.

The research, if successful, will yield information necessary to shape sanitation and hygiene service delivery for Moroto district thereby contributing to improved health in the district.

Attached is a photocopy of my student Identification. I shall submit to your office the letter of introduction from International Health Sciences University in due course.

Looking forward to your kind consideration.

Daniel Emadu

Public Health specialist
0773-773306/0757-990230
Technical Support Unit 9 Moroto
Ministry of Water and Environment.

Granted
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